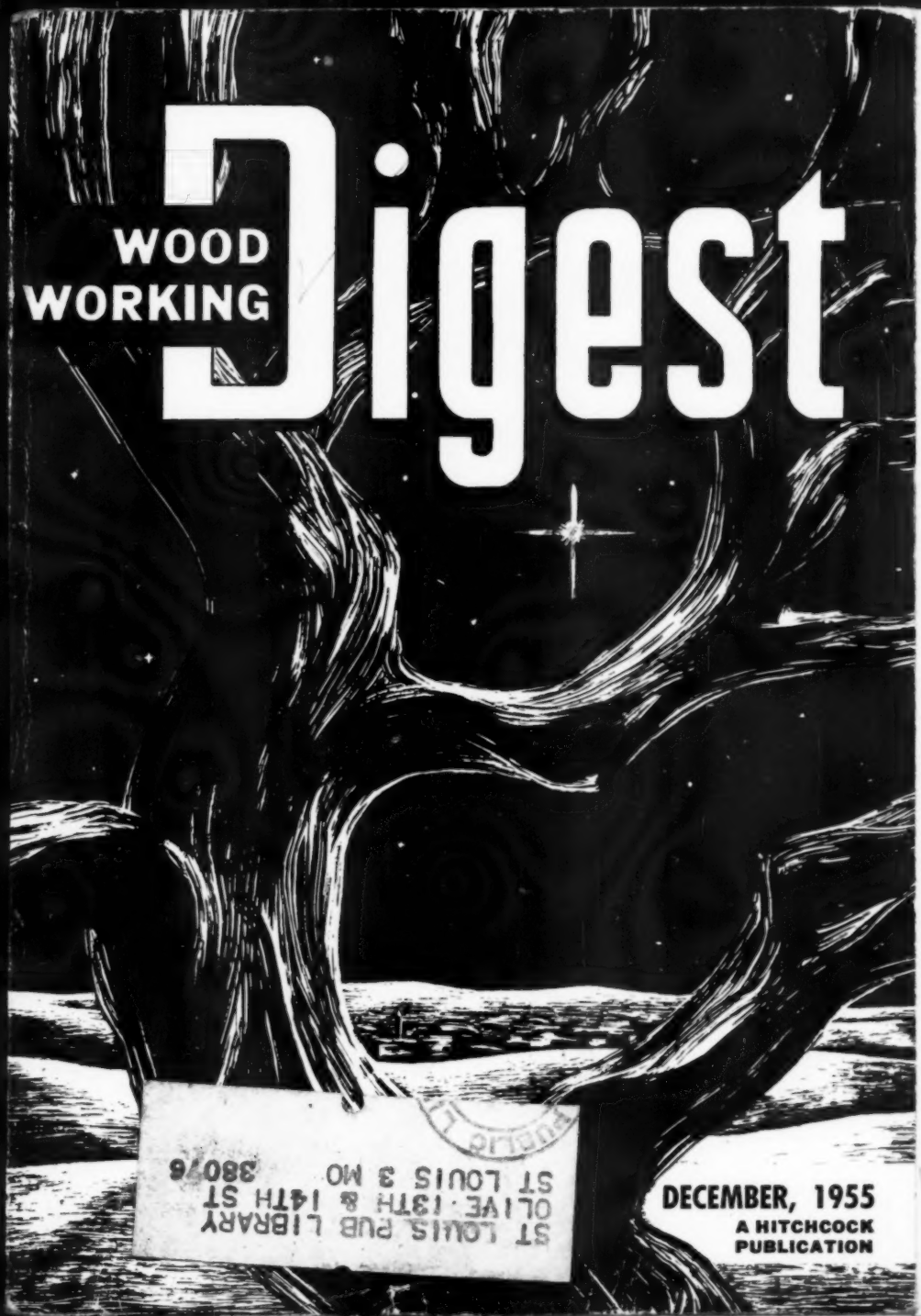
# WOOD WORKING Digest



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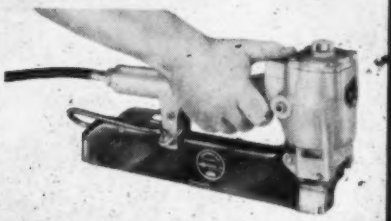
DECEMBER, 1955
A HITCHCOCK PUBLICATION

# SPOTNAILERS

## FOR FASTER, LOWER COST NAILING AND PINNING

### MODEL M—PUSH BUTTON—AIR DRIVE

Dependable pneumatic Spotnailer drives heavy guage staples or pins in lengths up to 1¼ inches at high speed.



### MODEL A

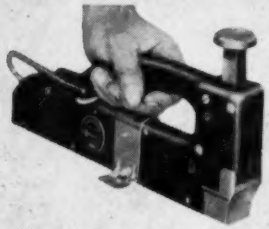
SPECIAL SHORT MODEL—MALLET DRIVE

Spotnailers speed up those "impossible" jobs. Extended nose fits hard-to-get-at corners.

### MODEL AF

STANDARD MALLET DRIVE SPOTNAILERS

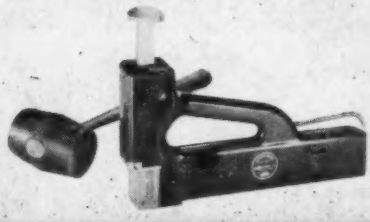
Extremely dependable, medium duty machine widely used for fastening millwork, floor underlayment, etc.



### MODEL B

STANDARD HEAVY DUTY—MALLET DRIVE

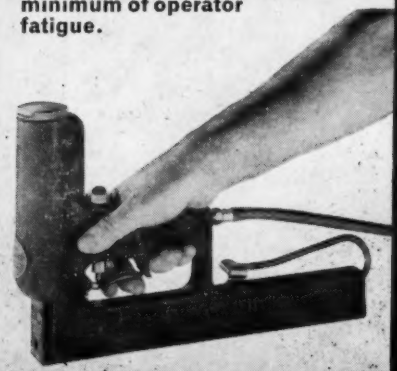
For driving longer heavy-gauge staples and pins. Magazine holds up to 200 fasteners.



### MODEL P

HIGH VELOCITY—AIR DRIVE

Well balanced tool speeds fastening operations with a minimum of operator fatigue.

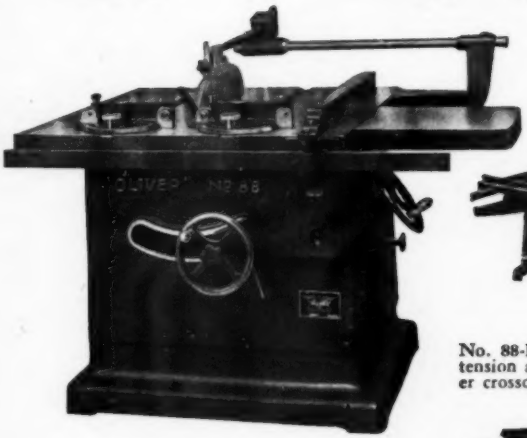


*Your Spotnail Man can help you solve tough fastening problems. Call him now.*

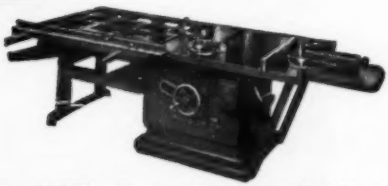
**SPOTNAILS, INC.**

EVANSTON 1, ILLINOIS

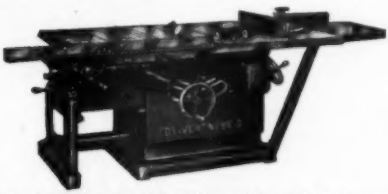
# "OLIVER" SAW BENCHES simplify the handling of large panels



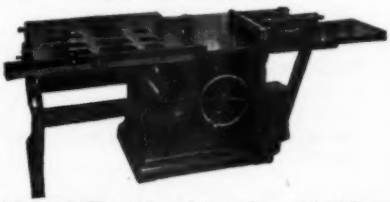
***6 models of extra large capacity***



No. 88-DX — Large main table, and table extension at right of saw. No. 88-DXL has greater crosscut capacity and larger rolling table.



No. 88-DY—Special rolling table at left of saw and table extension at right. No. 88-DZ doesn't have table extension at right of saw.



No. 88-DW — Non-tilting arbor and table extension at right of saw. Rolling table at left of saw. No. 88-DWL has greater crosscut capacity and larger rolling table.

No. 838 — Heavy duty machine with traveling saw. Capacity: 12′ long, 6′ wide, 4″ thick.

## *Choose the machine that fits your needs best!*

• If your operations require the handling of stock of large dimensions, look into the advantages of the No. 88 Tilting Saw with its 7 different tables.

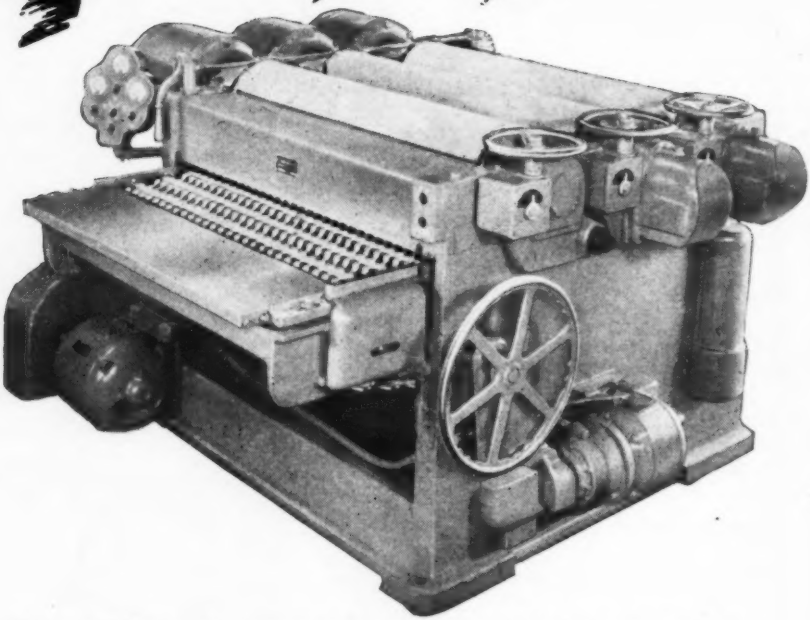
• This "Oliver" is built with power, stamina, capacity and speed to cut your production costs. It rips, crosscuts, dadoes and miters with precision. Has most complete and accurate set of gauges to reduce set-up time. The No. 88-D (above) rips to 50″, crosscuts 48″ x 1″ thick. Write today for Bulletin No. 88.

**OLIVER MACHINERY CO.**
**GRAND RAPIDS 2, MICHIGAN**

# THE SMITH

## ENDLESS BED SANDER

WITH SELF-OSCILLATING DRUMS AND VARIABLE SPEED DRIVE, 12' TO 35' PER MINUTE



**Self oscillating mechanism,** quarter inch stroke, 144 strokes per minute.

An exclusive feature found only on the **Smith** machine.

An example of the tradition of building only the **best in** woodworking machinery **for over 108 years.**

There are many other exclusive features built into the **Smith 2, 3, and 4 Drum Endless Bed Sanders** that **you** should investigate.

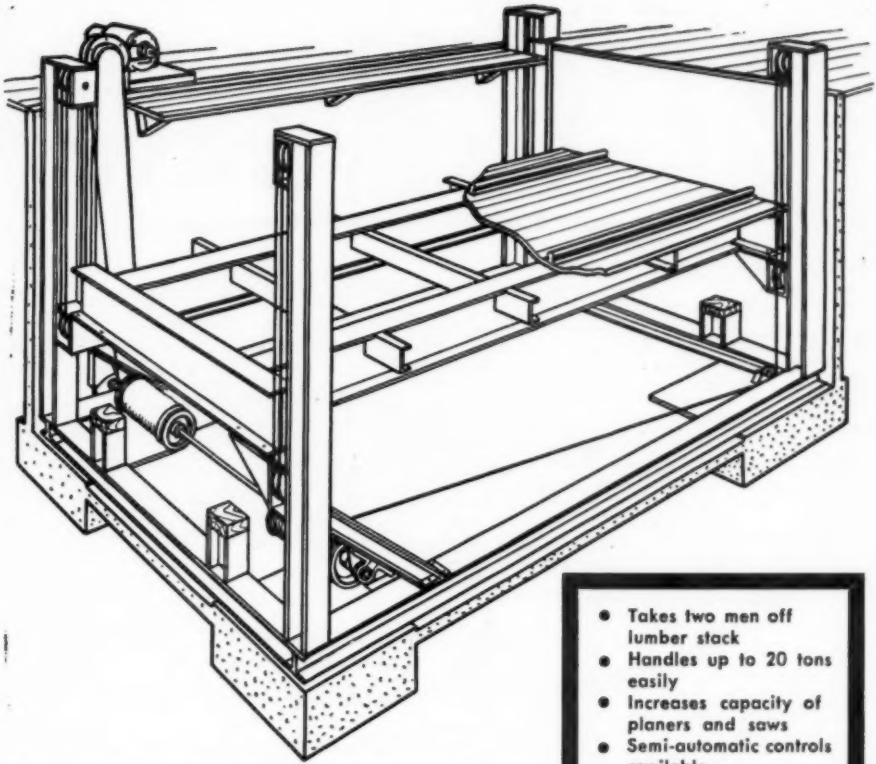
Just write and say "I want more information about the **Smith Endless Bed Drum Sanders** and tell me about your **lease plan** also".

WOODWORKING MACHINERY MANUFACTURERS ASSOCIATION WMMA

# H. B. SMITH MACHINE CO.

**SMITHVILLE**

**BURLINGTON COUNTY** **NEW JERSEY**



- Takes two men off lumber stack
- Handles up to 20 tons easily
- Increases capacity of planers and saws
- Semi-automatic controls available
- Floor level drive gives easy access . . . less danger from water seepage in pit
- Engineered and installed by experts in materials handling for the Woodworking industry

# INCREASE PRODUCTION! LOWER LABOR COSTS!!

Woodworking plants throughout the nation are getting new materials handling economy and top production efficiency with the Walters Lumber Lift.

**TYPICAL INSTALLATIONS**

Art Furniture Co., Macon, Ga.
Kewaunee Mfg. Co., Adrian, Mich.
Prestige Chair Co., Newton, N. C.

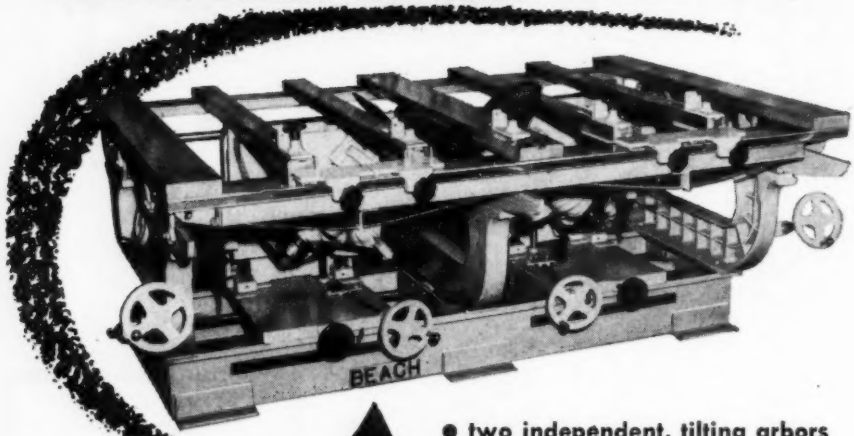
**WALTERS MFG. CO.**
SINCE MORRISTOWN TENNESSEE 1927

**WALTERS MFG. CO.**
Dept. DW - 934 E. Main Street
Morristown, Tennessee

Please send full details on the Lumber Lift.

COMPANY NAME .....
ADDRESS .....
CITY..... STATE.....
BY..... TITLE.....

# SPECIFY BEACH DOUBLE CUT-OFF SAW




- **two independent, tilting arbors with built-in motors**
- **table travel from 24"-100"**

TILTING TABLE SAW

Where high precision woodworking operations are necessary, specify BEACH DOUBLE CUT-OFF SAWS. Tilting arbors make it possible to: 1) cut 2 mitres, 2) cut square at one end and mitre the other, 3) square both ends in one operation, 4) cut a compound mitre with 1 saw.

**CARRIAGE mounted on ANTI-FRICTION ROLLERS for greatest accuracy of movement**

**END ROLLS and tracks have flat surfaces**

**SLIDING TABLES may be secured in any desired position with a single hand screw**

**ARBORS are independent units with ball-bearing, 5 H.P. motor mounted on mandrel. Each arbor tilts to 45° with 6" independent vertical adjustment**

**MANDREL SPEED 3600 R.P.M.**

***WRITE TODAY!***
for complete information and specifications on the Beach Double Cut-Off Saw.

**BEACH**
**MANUFACTURING CO.**
**MONTROSE, PA.**

December, 1955
Vol. 37 No. 12
Published Monthly

# WOOD WORKING Digest

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WM. F. SCHLEICHER
Associate Editor

THOMAS D. PERRY
Contributing Editor

L. M. SCHROEDER
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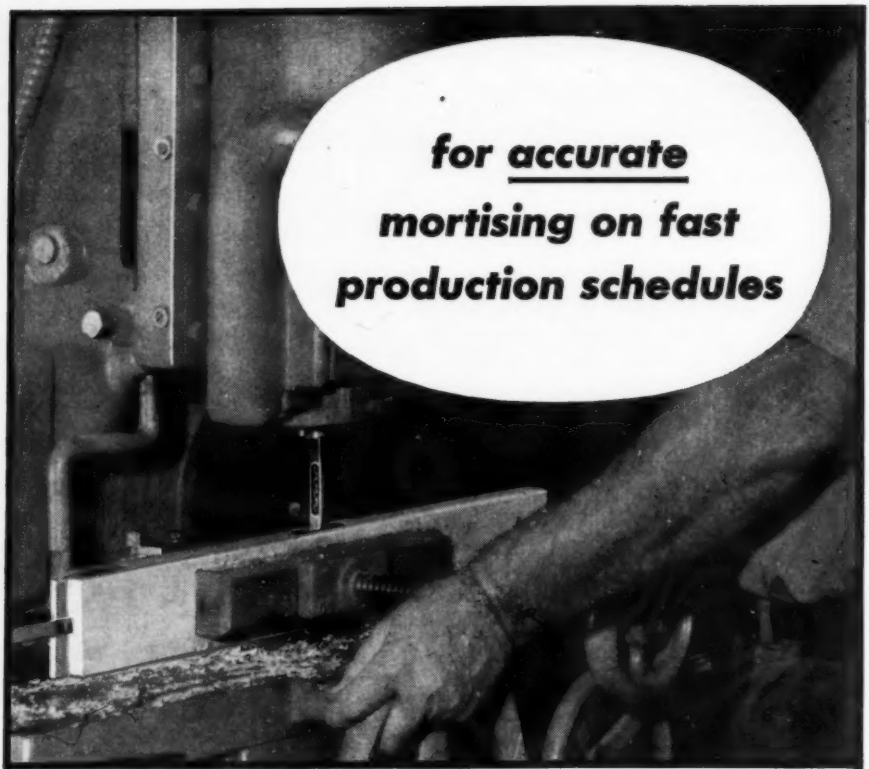


## get GREENLEE Hollow Chisels and Bits

Fast-clearing, long-lived GREENLEE Hollow Chisels and Bits add speed and accuracy to the production and assembly of your products. Made by the originators of the hollow chisel mortiser, these high-quality tools make "clean" mortises easily, swiftly, economically.

Available in a *complete* line for hard or soft wood and all makes of machines. Write today for new illustrated Catalog 34-M describing these and other GREENLEE tools for mortising, boring, and routing.

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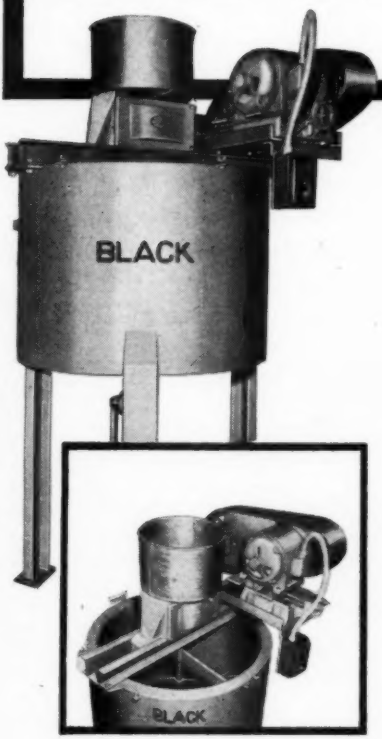
Tools for boring, routing and mortising • Hollow Chisel Sharpeners • And many others
Mfrs. of Teco Grooving Tools for Timber Connectors • GREENLEE Woodworking Machines include Tenoners • Saws • Mortisers • Borers • Planers • Shapers

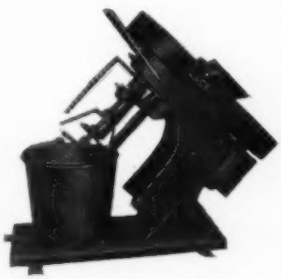
THE BLACK BROTHERS

# Cold Glue Mixers

FOR POWDERED OR LIQUID ADHESIVES




The Black Brothers stationary cold glue mixers are made in a full range of capacities from 10 to 500 gallons. They are the result of expert engineering combined with years of practical experience in glue equipment manufacturing. Their many features include: (1) Sifter for glue powder (2) *Double agitators which give a beating action resulting in the smoothest possible mixture in the least possible time* . . . see close-up on left (3) Pressure lubrication (4) Cut steel gears . . . hardened and lapped (5) Large quick-acting valve at bottom. Optional equipment includes (1) water jacket (2) variable speed drive. For full information write today for Bulletin 11-1.



The Black Brothers portable motor driven cold glue mixer is made in 2, 5, 7½, and 15 gallon sizes. It has a number of exclusive Black Brothers features such as glue powder sifter, two-way agitation, and specially shaped flat paddles to give a beating action to the agitator. In addition this mixer has a hinged arm that swings up to allow the pail to be inserted or removed. Write for Supplement to Bulletin 11-1.

*"If it Is Gluing Equipment—We Have It"*

THE BLACK BROTHERS CO., INC., Mendota, Illinois

# SPECIAL-PURPOSE
## *and self–*

### UPHOLSTERY CLIPS

Applied by hand or with simple hand tool . . . suitable for range of application thicknesses and materials . . . sure, positive, gripping action . . . do not catch clothing . . . stay out of sight after assembly.

These fasteners and other devices are designed either to speed in-plant assembly or to make possible K-D shipment of furniture for assembly by unskilled store personnel or the ultimate purchaser. United-Carr has pioneered in

### SEAT CLIPS

Attach padded, wood-framed seats to tubular metal frame . . . permit K-D shipment . . . provide quick, dependable fastening at home, store or warehouse. Sizes to fit range of tube diameters and basic frame designs.

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Provide positive anchorage for bolt or threaded rod in metal tubing . . . push in easily . . . can be removed only with substantial withdrawal force . . . useful in tubing assemblies to attach handles or other tubular components . . . available to fit wide range of thread and tubing sizes.

### CAPPED RATCHET PLATES

Decorative hub caps for furniture and wheel goods. Teeth bite into metal rod or axle so rod requires no nuts, threads or cotter pins. Available in range of sizes, light or heavy action, for push-on or hammered assembly . . . aluminum or nickel-plated caps.

### PLASTIC BASE SWIVEL GLIDE

Non-corroding butyrate feet for tubular or wooden tables or chairs . . . accept legs at angle to floor . . . wide range of plastic colors and metal finishes available in combinations.

# UNITED-CARR

**31 Ames St., Cambridge 42, Mass.** • ***In Canada:*** **Gage Ave. and Beach Rd., Hamilton, Ont**

# FURNITURE FASTENERS

## *fastening devices*

the field of fasteners specially designed for furniture production and, if you have a volume production problem that requires fasteners of a new or special design, United-Carr's engineering staff is at your service.

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Deaden noise, ease motion in sliding metal drawers . . . snap into place and stay put in hole stamped out of drawer wall . . . available in nylon or polyethylene material.

### SUPER-SILENT SWIVEL GLIDE

Floats on rubber, slides on steel . . . base is completely insulated from chair or table by rubber cushion. Teeth hold glide in tubular metal legs. Swivel base allows glide to stand flat even though legs slope.

### LONG PRONG TEENUT

Has curved prongs that provide twisting action for extra holding power as Teenut is driven into bored hole. Components can be repeatedly assembled and disassembled . . . provides steel threads in wood . . . permits K-D shipment.

### SHORT PRONG TEENUT

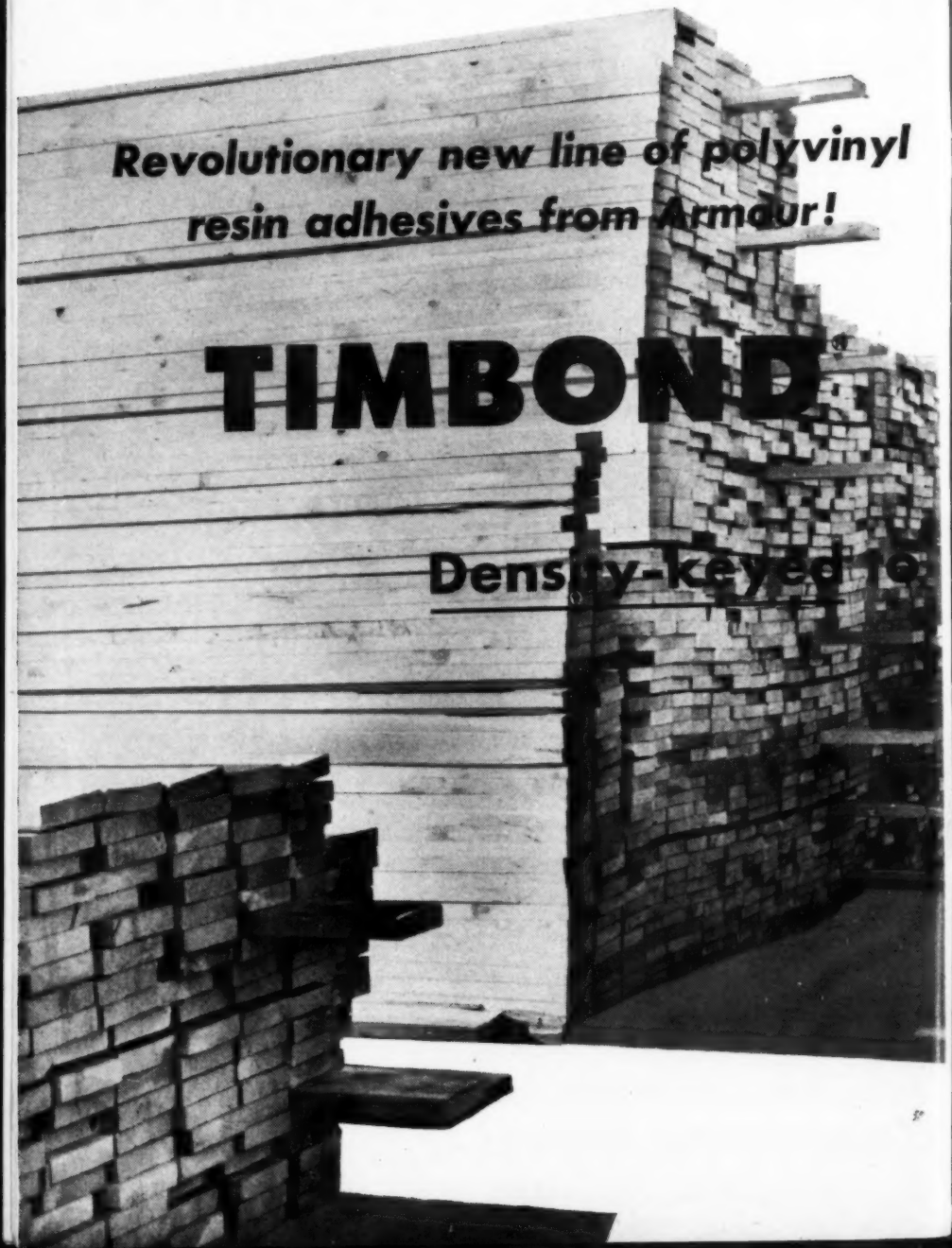
Can be held in place by brads until final attachment of components by dealer or purchaser. Short prongs prevent turning when hanger bolt is tightened.

### RECTANGULAR FLANGE TEENUT

Has narrow base for use in limited spaces. Held in place by brads instead of prongs. Specially designed for heavy duty applications.

**Fastener Corp.**

*MAKERS OF* DOT *FASTENERS*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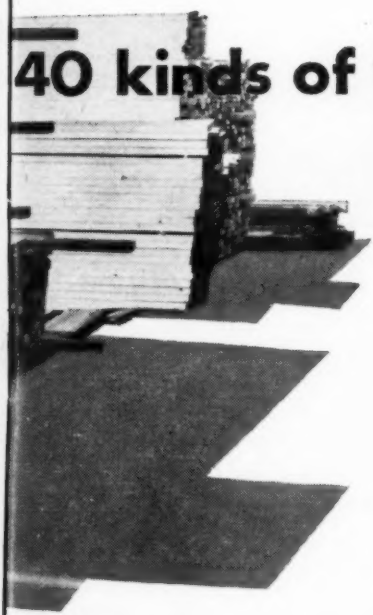
TIMBOND®
Density-keyed to

HERE, at last, is the answer to the problem, "Which glue is right for the woods I use?" Glues that are too weak result in poor bonds and joint separations. Glues that are too strong are an unnecessary expense. Now you can order the polyvinyl resin adhesive that's keyed to the densities of the woods you use. Called TIMBOND, this new Armour line of density-keyed adhesives was developed after extensive testing with 40 different woods. The new TIMBOND line assures you maximum adhesive performance for every kind of wood you use—at maximum economy!

Armour's new TIMBOND polyvinyls dry quickly into tough, odorless, mold-proof, vermin-proof, water-resistant, light-colored films. And each new TIMBOND produces a bond of superior strength and shock resistance equal to or greater than the strength of the woods it's designed for. No diluting or heating is necessary. Application can be made by roller, glue gun or brush. Stability is substantially unchanged after three cycles of freezing and thawing.

Mail this coupon today. Simply designate the wood or woods you use. We will send you product and ordering data on the TIMBOND adhesive which is *density-keyed* to your woods.



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**CLIP AND MAIL TODAY!**

Armour and Company, 1355 West 31st Street, Chicago 9, Illinois
I would like further information on TIMBOND.

I use _____ in my woodworking operations.
(name of wood or woods)

Name _____ Title _____

Firm _____

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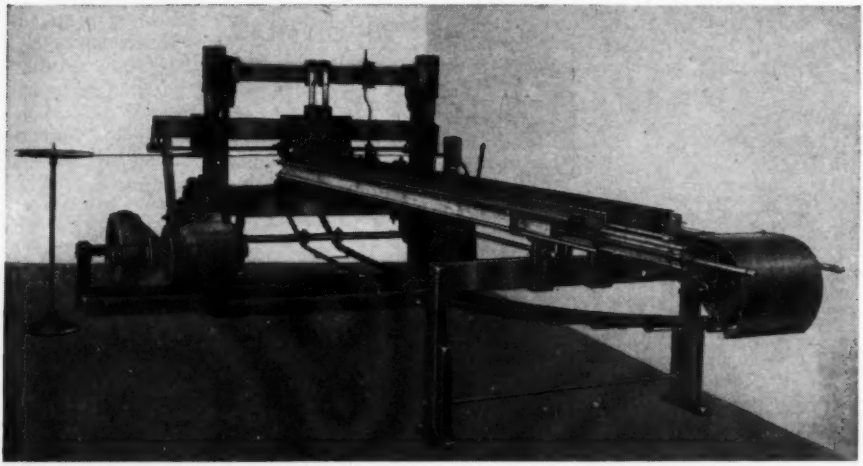
City _____ Zone _____ State _____

# SPLICE WOOD PARTS AT THE SPEEDS YOU WANT!

**from this hand feed,** Saranac No. 1 Corrugated Fastener Driver, you get dependable low-cost splicing. Rugged and versatile for joining box shooks, coat hangers, etc.



**40 BLOCKS PER MINUTE**
**(14" x 14" size) spliced on chain feed machine.**

**Write for full details**

**to this chain feed for large volume**

**With Saranac** Splicers — hand or chain feed, single or multiple-head — you can get the speeds and capacities you need. Heads cut and drive fasteners direct from coils of plain or saw edge ribbon — in range of widths from ¼" to 1". With crew of only two or three persons, chain feed models deliver tremendous production . . . can be built to handle work up to 70" wide. Investigate now!

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**Benton Harbor, Michigan**
*Manufacturers of the World's Largest Line of Fastening Machinery*

# Nothing Compares with the WHITNEY 97 DOUBLE SURFACER

## For quality production and low cost planing

**Whitney 97 Double Surfacer**
Feeds: 30 to 90 feet per minute
Planes stock ⅛" to 7" thick
Widths, 30" 36" 40" and 44"

The Whitney 97 Double Surfacer, the last word in modern planer design, is built to handle your double surfacing requirements. Its rugged proportions and faster feeds permit it to handle easily the volume production required in today's modern plant. Traditional Whitney accuracy and careful workmanship assure smooth, accurate planing, continuous production, low cost maintenance and the stamina to produce best results under the severest kind of service.

The Whitney 97 will bring to your plant a new conception of production efficiency and cost savings. High production quotas will be maintained and sanding and finishing costs substantially reduced. Investigate today the Whitney 97 for your double surfacing requirements. Write for full particulars. Ask for planer bulletin **D 1.**

### *Check these features*

- Wedge Construction
- Nitralloy Center Table
- Ball and Roller Bearings thruout
- Motor Raising and Lowering of Bed
- Built-in Variable Speed Feed
- Micro-feed Selector
- Automatic Power Feed Grinder

*In our 117th year*

**Baxter D. Whitney & Son, Inc.**
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*Quality Built Woodworking Machinery Since 1837*

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**FOR MORE THAN 100 YEARS**

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**Recent issues of THE GLUE LINE have carried articles on a wide variety of subjects including: Glue Selection, Glue Handling & Storage, High Frequency, Moisture Content Detection, Moisture Control, Hardwood Plywood Imports and similar topics.**

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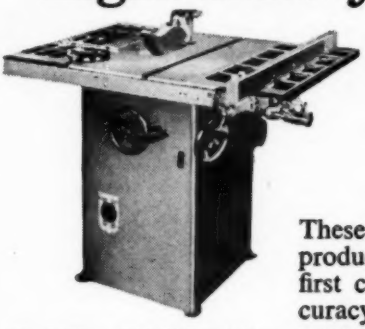
# These **NEW** Walker-Turner "Light-Heavyweights" give you



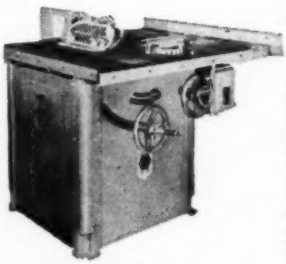
## BIG MACHINE PERFORMANCE at LOWER COST

These rugged new saws slice right through your production costs . . . start earning their way the first cut you make. Here's performance and accuracy you'd normally find only in much heavier, more expensive machines.

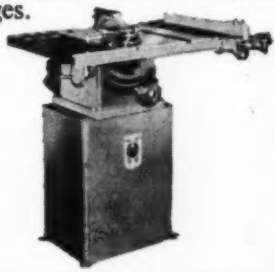
Faster, smoother production cutting is built right into these new Walker-Turners! Motor mounting and arbor *tilt as a unit*. Guard and splitter are always lined up with the blade for protection at any angle. Saw arbors mounted on precision ball bearings on all models.

Ask your Walker-Turner Distributor for complete specification sheet, and a demonstration of what these new saws will do for *you*. He's there to help you. You'll find him listed under "Tools" in your phone book's Yellow Pages.

**No. 2221 — 10" Tilting Arbor Saw** — Capacity: 3⅛" with 10" blade; 2⅛" at 45°; with 6" dado, 1⅛". Speed: 3800 rpm. Table: 32½" deep x 32" wide; 32½" x 45¾" with extensions. With 10" combination blade, extension tables, miter gauge, guard, splitter, motor pulley and belt (without motor) $297.00.



**No. 2450 — 14" Tilting Arbor Saw** — Capacity: 5" with 14" blade, 3½" at 45°; with 8" dado, 2". Speed: 3450 rpm. Table: 38¾" deep x 48" wide with extension. With 14" combination blade, extension table, miter gauge, splitter, guard, including 5 hp 220/440 volt 60 cycle 3-phase motor, with push button station. $946.50.



**No. 2121 — 8" Tilting Arbor Saw** — Capacity: 2⅝" with 8" blade, 1½" at 45°; with 6" dado, 1⅝". Spindle speed: 4000 rpm. Table: 23" deep, 19" wide; 23" x 37" with extensions. With 8" blade, extension tables, miter gauge, guard, splitter, belt, motor pulley and sub base (without motor) $192.00.

walker-turner

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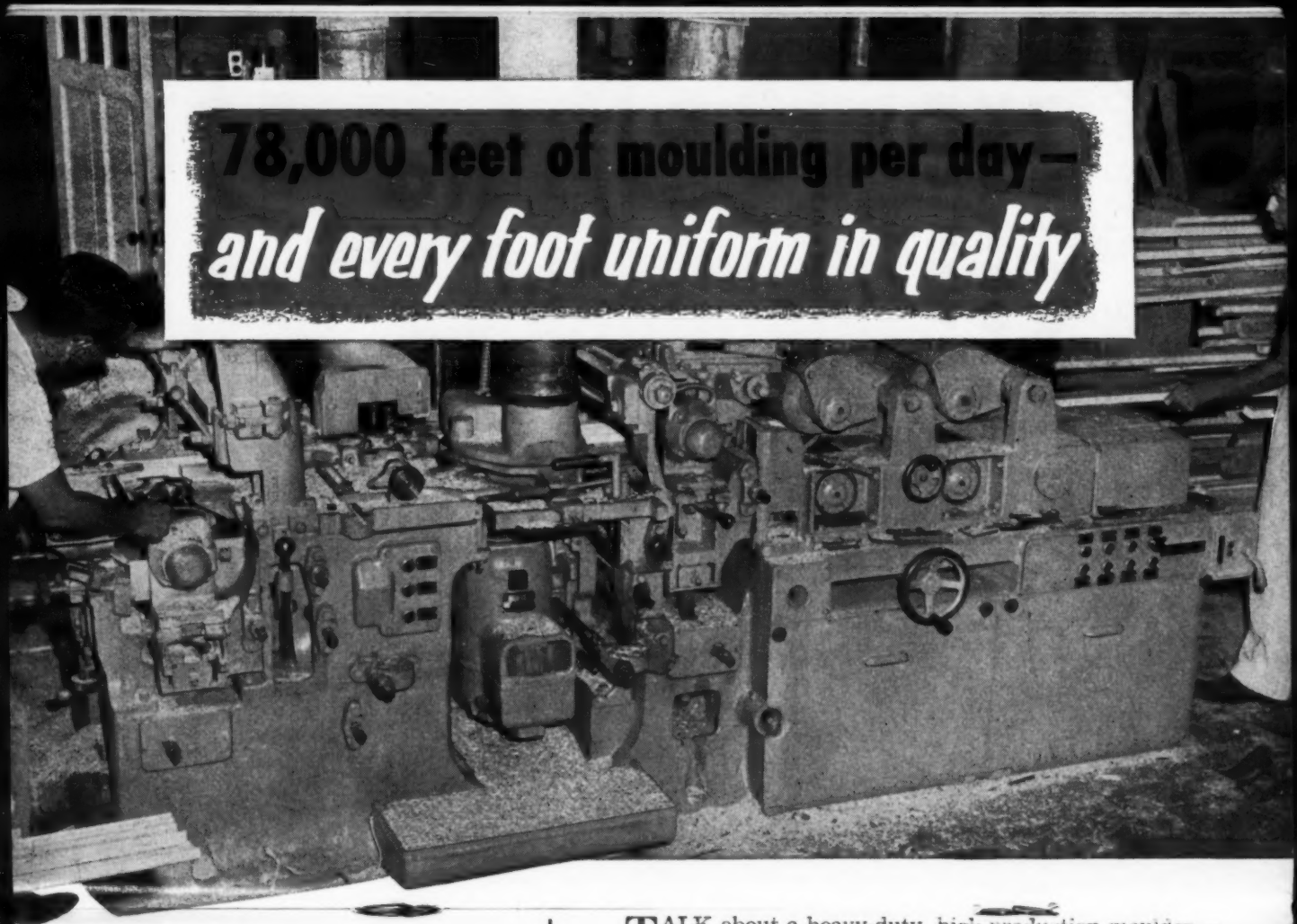
BELT AND DISC SURFACERS • FLEXIBLE-SHAFT MACHINES



# 78,000 feet of moulding per day—
# *and every foot uniform in quality*

TALK about a heavy-duty, high-production moulder — the C 99 is it!

That's profitable production . . . the kind Shaw Mfg. Co., Sumter, South Carolina, gets from this

## *Yates-American* C-99 Moulder

TALK about a heavy-duty, high-production moulder — the C-99 is it!

For one thing, you get rapid changes in set-ups. At Shaw Mfg. Co., Sumter, S. C., for example, they run 160 feet of moulding per minute. And they use more than 75 different patterns, so changeovers are frequent.

Shaw moulder operators also like these other advantages of the C-99: The powerful feed-works. The upper rolls that adjust themselves to thick or thin lumber. The extra safety provided by the spindle brakes.

G. W. Shaw, president, writes, "There are so many good features about the C-99 moulder that we could hardly enumerate them all. All we have to say is the very highest praise."

See for yourself why woodworkers everywhere are so enthusiastic about the Yates-American C-99 Moulder. Ask the Yates-American man to show you one in actual operation. And mail the coupon for bulletin.

*Yates-American*

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BRANCH OFFICES: CHICAGO, ILLINOIS; HIGH POINT, NORTH CAROLINA; MEMPHIS, TENNESSEE; PORTLAND, OREGON

*First* with the *Finest* in woodworking machinery

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YATES-AMERICAN ww-5

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Send me free bulletin on the Yates-American C-99 Moulder.

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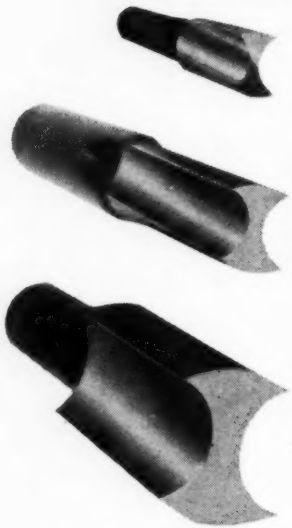
Company Name.....

Address.....

City..... Zone..... State.....

# 6 Reasons Why VMT Router Bits Are Different



VMT Double Wing Router Bits for smoother cutting

1. Specially designed high cutting lip—low cutting resistance
2. Extra large clearance angle—permitting chips to fly clear of wood
3. Sharpened flute and individually honed cutting edges makes bits ready to cut when received
4. Free action of cutting edge — assures smoother work
5. Salt bath process insures uniform hardness from center of bit to surface and maintains precision accuracy
6. High tensile and transversal strength add up to lasting, accurate performance

## ALWAYS LOOK FOR THE ROUTER BIT WITH THE BLACK SHANK

Complete line of standard sizes VMT Router Bits carried in stock

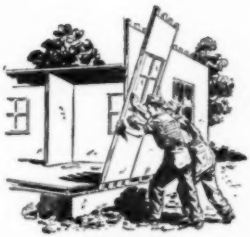
- High Speed Single Wing
- High Speed Double Wing
- Double End High Speed Single Wing
- Double End High Speed Double Wing
- Carbide Tipped Single Wing
- Carbide Tipped Double Wing

When ordering, specify stock number or specify dia. of cut, dia. of shank, length of cut, length of shank and number of cutting edges. Send for free catalog "Precision Made Cutting Tools for the Woodworking Industry"

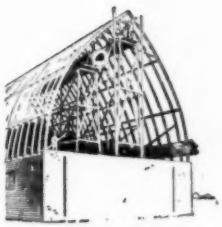
**Virginia MACHINE TOOL CO.**

BASSETT, VIRGINIA

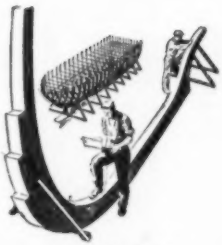
Precision Made Tools For The Woodworking Industry—Standard or Milled To Pattern



Sturdier
Prefabrication Panels



Stronger
Barn Rafters



More Rugged
Boat Construction

Tougher
Laminated Crossarms

# ...And all are more durable because they are bonded with PENACOLITE® ADHESIVES

Good properties of Penacolite Resorcinol Adhesives make them just right for the types of wood bonding jobs shown here. And the woods they bond *stay* bonded in spite of age or long exposure.

Penacolite bonds are completely waterproof, and remain as strong as the woods they join through all kinds of temperature changes. Furthermore, they withstand the shrinking and swelling of wood due to rain, sun, heat or cold, and are unaffected by exposure to greases, oils and most solvents.

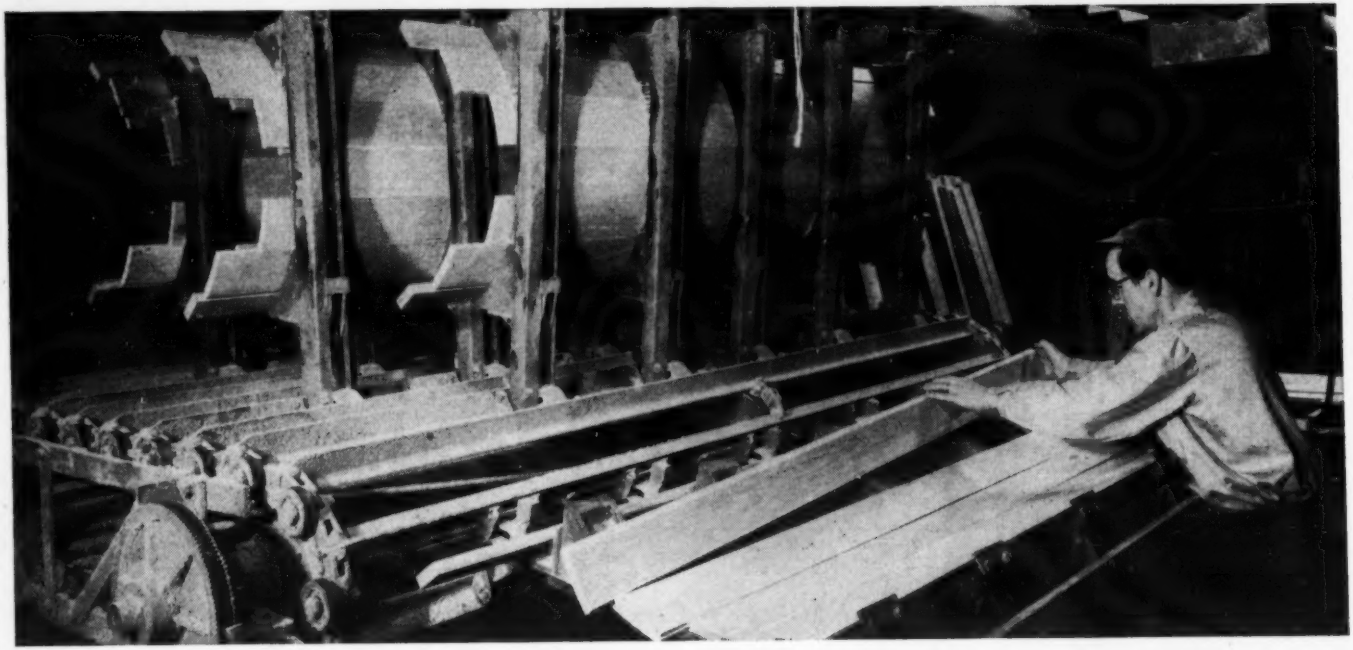
Write us for information on Penacolite Adhesives. Our free, illustrated booklet gives complete details on these and *many* other applications. Koppers Company, Inc., Chemical Division, Dept. WD-125, Pittsburgh 19, Pa.

KOPPERS®

**PENACOLITE® RESORCINOL ADHESIVES**

*The original waterproof, room-temperature-setting adhesives*

# in edge gluing for caskets



Flawless craftsmanship is traditional in the hardwood burial cases made by the New England Casket Company of East Boston, Massachusetts. Gluing is simplified with WOOD-LOK, National's cold run, ready-for-use resin glue. It helps create invisible glue lines, yet prevents chilled joints and speeds production.

# WOOD-LOK prevents chilled joints

**WOOD-LOK** allows 5-7 minutes open assembly time, more than

**WOOD-LOK** absorbs the impact of shaping blades with ease

**WOOD-LOK** allows 5-7 minutes open assembly time, more than enough to avoid chilled joints in edge gluing extra long stock. Speed of set remains constant despite changes in humidity. Stock may be removed from clamp carrier after 30 to 45 minutes. No heating or mixing is necessary.

**WOOD-LOK** absorbs the impact of shaping blades with ease in this rugged turning operation. Films are neither brittle nor abrasive. Lathe knives need sharpening less frequently. Posts are built from a combination of willow, oak, birch and mahogany. Glue lines are imperceptible after turning.

RESYNS®
National
ADHESIVES

SPECIAL OFFER! Write for 5 gallons of WOOD-LOK and a complimentary glue applicator—on a trial and approval basis.

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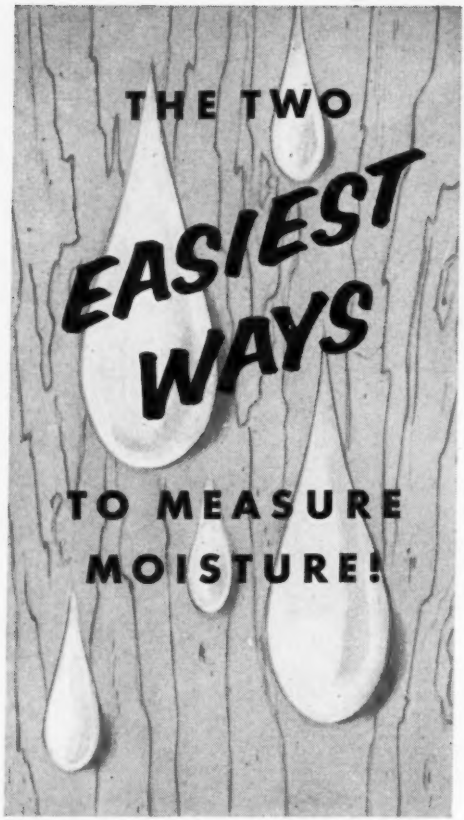
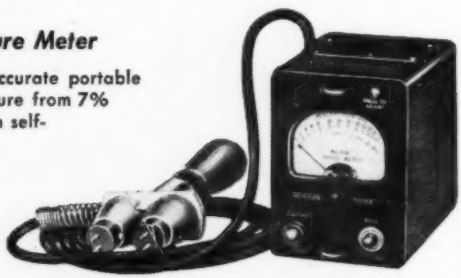


**WESTON** *ALL-PURPOSE*
**MOISTURONIC**
***Moisture Meter***

Here is the most versatile moisture meter, yet the simplest and easiest to read. Measures up to 150% moisture on the double-range scale (readings above 30% for comparative purposes). Utilizing the precise resistance principle, it has the same dependability typical of all WESTON instruments. Available in both battery and A-C types, with a sturdy carrying strap. Weight less than 10 lbs. Send for bulletin W7B.

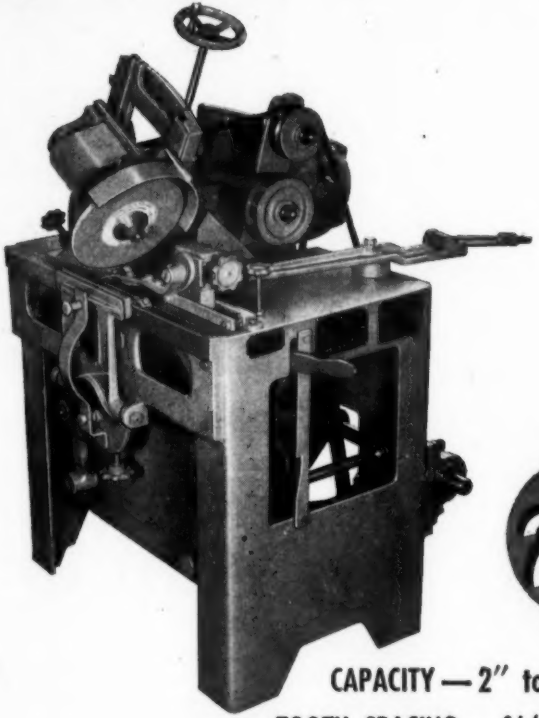
**WESTON** *Midget Moisture Meter*

The smallest, most convenient and accurate portable meter. Instantly indicates wood moisture from 7% to 30%. Weight less than 4 lbs. with self-contained batteries. Unequalled for quick, portable use—checking lumber, lath, shingles, plaster walls, plywood, etc. Send for bulletin W2C.



**WESTON** *Moisture Meters*

WESTON Electrical Instrument Corporation, 614 Frelinghuysen Ave., Newark 5, N. J.



MODEL
207

CAPACITY — 2″ to 8″ wide
TOOTH SPACING — 3/4″ to 2 1/4″

**HANCHETT MANUFACTURING COMPANY**

*World's Largest Manufacturers of Saw Sharpening and Knife Grinding Machinery*

MAIN OFFICE:
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# HANCHETT

**MOTOR DRIVEN**

*Fully Automatic*

## BAND SAW SHARPENER

*with*

BEARINGS — 100% precision anti-friction

TOOTHCAM — adjustable for any tooth shape or spacing

FEED ARM — rigid, heavy duty

WORM AND GEAR — run in oil

GRINDING WHEEL — 8″ diameter

SPEED — 32 teeth per minute

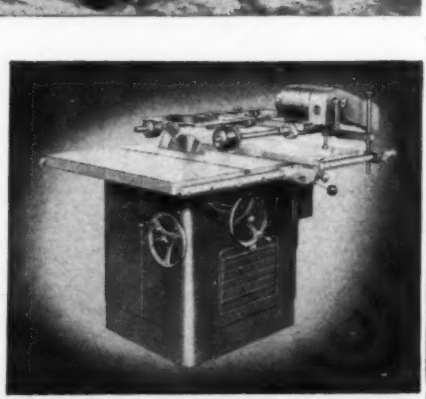
*AVAILABLE also with new pedestal mounting stand*

WRITE FOR DETAILS THIS AND OTHER MODELS

# Break Production Bottlenecks

## DELTA 12" Tilting Arbor Saw . . .

This rugged, heavy duty saw gives you greater capacity for production cutting. And with Delta's new Power Feed Unit, designed expressly for use with the Delta 12" Tilting Arbor Saw, you get an accurate, high-speed *production* ripping machine *at less cost* than most production table saws alone! Speeds from 20 to 90 feet per minute . . . straight, accurate cuts . . . safe, easy operation. And the unit quickly swings down out of the way for full use of the saw alone.



# at Low Cost . . . with a Rockwell-built DELTA Unisaw®

This low-cost, multi-purpose DELTA 10" Tilting Arbor Unisaw is designed to handle a large number of jobs—*throughout your shop*—on a fast, cost-cutting basis. It's built to give you all the speed, all the capacity, all the precision you need to do accurate cross-cutting and ripping—and with Delta's broad selection of accessories you can also cut dadoes, tenons, mouldings, and do many other jobs.

Because the versatile DELTA Unisaw is readily portable, you can use it anywhere in your shop—to eliminate bottlenecks—to reduce materials handling—to put greater flexibility into your woodworking operations. Yet, it's a rugged tool that will stand up under tough everyday use—and remain accurate year after year.

*Let your Delta Dealer show you why the Delta Unisaw is the finest 10" tilting arbor saw made today—and how it can help you speed-up production—cut costs. He's listed under "TOOLS" in the classified pages of your phone book. Send the coupon for complete details.*

## Compare These Built-in DELTA Features...

- **BIG CAPACITY**
  cuts stock 3⅛" thick, rips to center of a 50" panel.
- **PERFECT ALIGNMENT**
  carriage swings on strong, heavy trunnions with working surfaces fully machined.
- **THREE-BELT DRIVE**
  transmits full power, eliminates vibration, assures smooth, efficient operation.
- **SAFE, CONVENIENT CONTROLS**
  easy to reach, safe to operate.
- **MASSIVE MITER GAUGE**
  has adjustable stops for mitering and straight cut-off, long guide bar for added accuracy.
- **SEALED, LUBRICATED-FOR-LIFE BALL BEARINGS**
  no lubrication problems.
- **DOUBLE LOCK FENCE**
  extends full length of table, locks front and rear with controls located at front; has micrometer adjustment.

**DELTA** QUALITY POWER TOOLS

Another Product by **Rockwell**

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ROCKWELL

**DELTA QUALITY COSTS NO MORE**

Delta Power Tool Division, Rockwell Manufacturing Co.
666M North Lexington Avenue, Pittsburgh 8, Pa.

- ☐ Please send name of my nearest Delta Dealer.
- ☐ Please send me Delta AB Catalog.
- ☐ Please send me descriptive sheet on new Delta Power Feed Unit.

Name_____ Title _____

Company_____

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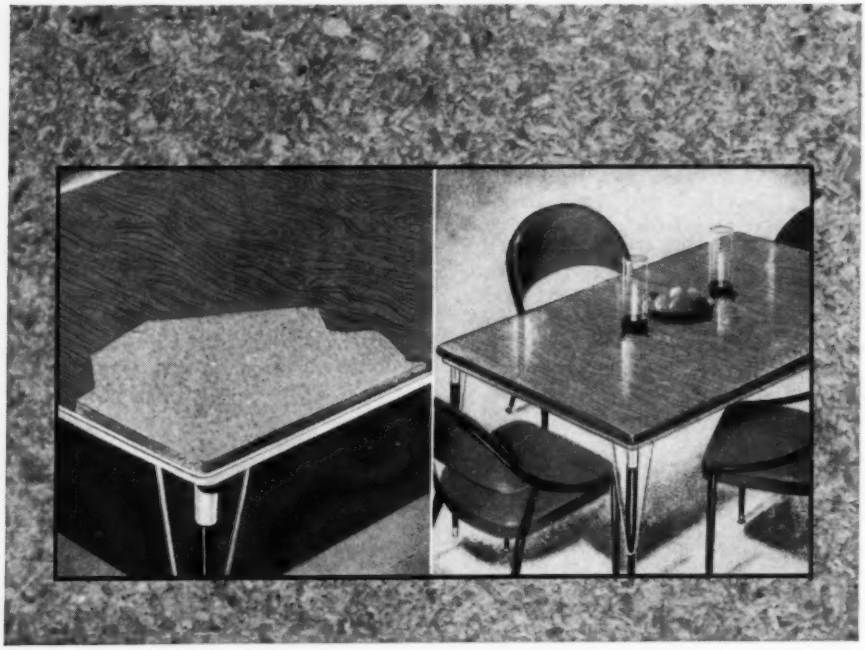
## AN IDEAL BASE FOR BETTER PRODUCTS



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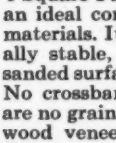
## 4-Square Particle Board

WANT TO MAKE a *basically better* laminated or veneered product? Use Weyerhaeuser 4-Square Particle Board as a base! Here is an ideal core stock for decorative surface materials. It is strong, durable, dimensionally stable, easily machined. Its smooth, sanded surfaces provide a strong glue bond. No crossbanding necessary because there are no grain or knots to mirror through the wood veneer or plastic laminate surface. Recommended as a core material for table, sink and counter tops; for front, end panels and tops of furniture; for cabinet doors, wardrobe sliding doors. Comes in 4′x8′ panels or cut to size: 3/8″, 1/2″, 5/8″, 3/4″ and 1″ thicknesses.

**Constant Supply at Uniform Price**

An important consideration in the production and costing of your product—is the uniform price and constant supply of Weyerhaeuser 4-Square Particle Board. You can space out shipments to meet recurring demands at maintained price levels.



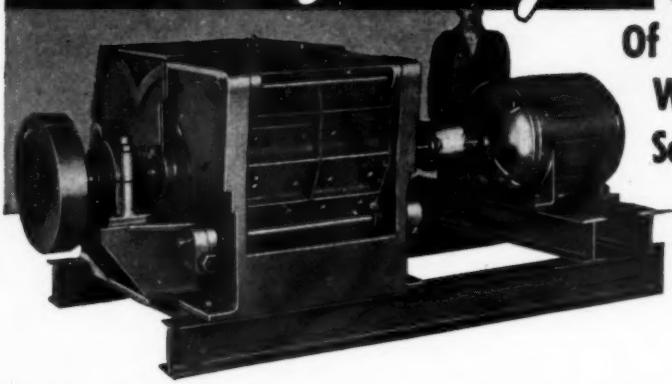
***Write for your copy today!***

Shows machining operations, suggests various uses. Find out how Weyerhaeuser 4-Square Particle Board can help you make *basically better* products!

**Weyerhaeuser Sales Company**
**HARDBOARD DEPARTMENT**
**First National Bank Building • St. Paul 1, Minn.**

# WILLIAMS "No Nife" Hogs

**Save Up To 75% Of The Cost Of Handling Wood Scrap!**



**Handling and disposal expense of waste wood can be cut as much as 75% by reducing it to chips in a Williams Hog.** If handled manually, one man alone can move as much tonnage as three men could handle if scrap is in long strips or awkward shaped pieces. If handled automatically, top efficiency can be obtained only if wood is first reduced to chips.

**In chip form, waste wood produces the greatest heat value.** Unhogged waste cannot burn evenly because jumbled distribution of small and large pieces restricts air flow, smothers the fire, creates excessive smoke. Hogged wood chips control passage of air for even and complete combustion, yield more BTU's.

**Savings in a few months will pay for an automatic installation** for conveying wood waste to stoker or boiler.

**WILLIAMS LINE IS COMPLETE**

• Hogging, Grinding and Shredding Machines • Vibrating Screens • Air and Mechanical Separators • Conveying Systems • Cyclone Collectors • Complete "Packaged" Plants

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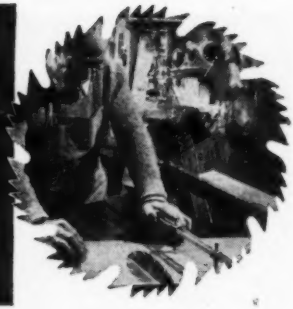
**WILLIAMS**

CRUSHERS GRINDERS SHREDDERS

OLDEST AND LARGEST MANUFACTURER OF HAMMER MILLS IN THE WORLD

YOUR TYPE—YOUR SIZE—YOUR SPEED

# Specify Silver Steel®



## SOLID TOOTH CIRCULAR SAWS—Flat or Hollow Ground

Ask for Atkins solid tooth circular saws . . . to save time on every cut . . . to save money on every blade . . . to get the kind of accuracy that cuts your finishing work. Whatever your woodworking requirements, depend on Atkins for the right saw.

**A-2 RIP**—Cuts fast and doesn't wobble. Holds a keen cutting edge—stays longer on the job.

**A-8 CUT-OFF**—For smooth cutting across the grain at maximum speed. Long-lasting edge stands up under heaviest use.

**A-44 COMBINATION**—Flat ground, rips or crosscuts equally well, fast, true. Holds cutting edge.

**A-37-H HOLLOW GROUND MITRE**—Rips, crosscuts or mitres smoothly. Saws fast without heating up—requires fewer sharpenings.

**SILVER STEEL NARROW BANDSAWS**—Uniform high quality; properly heat-treated to meet the demand for tough bandsaw blades with teeth that stay sharp.

**SILVER STEEL MACHINE KNIVES**—Accurate, precision cuts, fast cuts, for a longer time. Perfectly balanced knives packaged in sets.

**SILVER STEEL SMOOTH-END TRIMMERS**—Fast sawing, clean cutting—maximum clearance. For power or hand feed, green or dry lumber.

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Fast, complete saw service is as near as your phone. Depend on Atkins *Silver Steel* for all cutting, shaping, trimming, planing—and for cutting costs.

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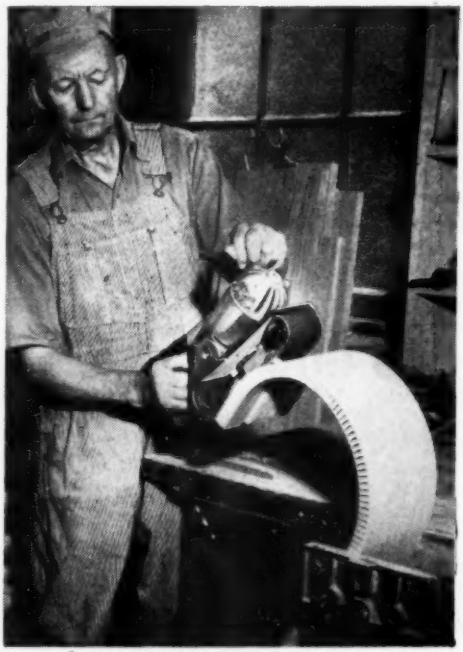
ATKINS Silver Steel SAWS

# "For 18 Years We've Finished Fine Staircases with our



New Model 448 Sander in work at Modern Stair Works

**Reaches all surfaces!** Flush side design permits sanding next to right-angle upright.

**Maximum comfort!** Contour-grip handle assures ease of operation and comfort. Two-position front knobs for convenience in vertical or horizontal work.

**No dust leakage!** Easy-to-empty dust bag has efficient suction system.

**Lightweight!** Die-cast aluminum housing for less weight and greater strength. Lower center of gravity for added stability.

***See Your Nearest Distributor for Complete Information or Call Your Nearest SKIL Factory Branch***

## SKIL BELT SANDER

## *—and it hasn't required a single major repair!"*

**Says Mr. A. L. Olson**
**Modern Stair Works**
**1132 Dodge Ave., Evanston, Ill.**

"Our SKIL Belt Sander gives us the ease of handling and adaptability we need for first-rate finishing of custom-designed staircases," says A. L. Olson, owner of the Modern Stair Works. "It improves workmanship, and does the job in half the time required with former hand methods."

Let a SKIL Belt Sander save *you* time and money. Call your SKIL Distributor for a free demonstration!

**SKIL Belt Sander Model 448**

3" belt, 1500 r.p.m. no load speed. Net weight, 15 lbs. including dust collector. Ideal for production use.

SKIL

**PORTABLE TOOLS**

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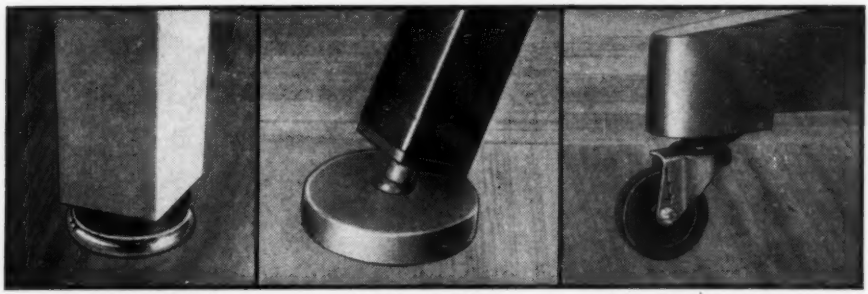
Factory Branches in ALL Leading Cities

# Perfect fit for any foot



Rubber-Cushion Glide | Full-Tilting Glide | "Diamond-Arrow" Caster

## Bassick glides and casters

Heavy or light, metal or wood furniture — there are Bassick glides and casters to fit them all!

And most important — they are designed to protect fine floors and floor coverings.

- **Rubber-Cushion Glides** slide silently on hardened steel bases that can't gouge.
- **Full-Tilting Glides** distribute the weight of modern spider legs over a wide area of contact.
- **"Diamond-Arrow" Casters** roll at a touch and swivel easily . . . make all types of furniture easy to move.

Look at your product again. Chances are Bassick casters and glides are the low-cost sales feature needed to put a "sold" ticket on your furniture. THE BASSICK COMPANY, Bridgeport 2, Conn. *In Canada:* Belleville, Ont.

Bassick
A DIVISION OF
STEWART SW WARNER

MAKING MORE KINDS OF CASTERS... MAKING CASTERS DO MORE

ADVERTISED IN The Saturday Evening POST

# New No. 6 ELECTRIC TENONER

**Here's the outstanding POWER Tenoner with built-in motor drives and simplified push button control. Fully ball bearing.**

Furnished complete with motors and control, crank for adjustment, head bolt wrench, poppet stop and spring stop for table slide, adjustable hold-down for table, guards for tenon heads, knives for all heads, and a cut-off saw.

Now, available, is the new No. 6 POWER Electric Tenoner . . . the result of more than 80 years of service to the woodworking industry. Accurate workmanship, heavy construction and a host of features including simplified controls, motors which can be raised or lowered, separate adjustment, etc. Let us tell you more about the No. 6 . . . write today.

**HIGHEST QUALITY SINCE 1867**

**Planers - Tenoners - Planers & Matchers**
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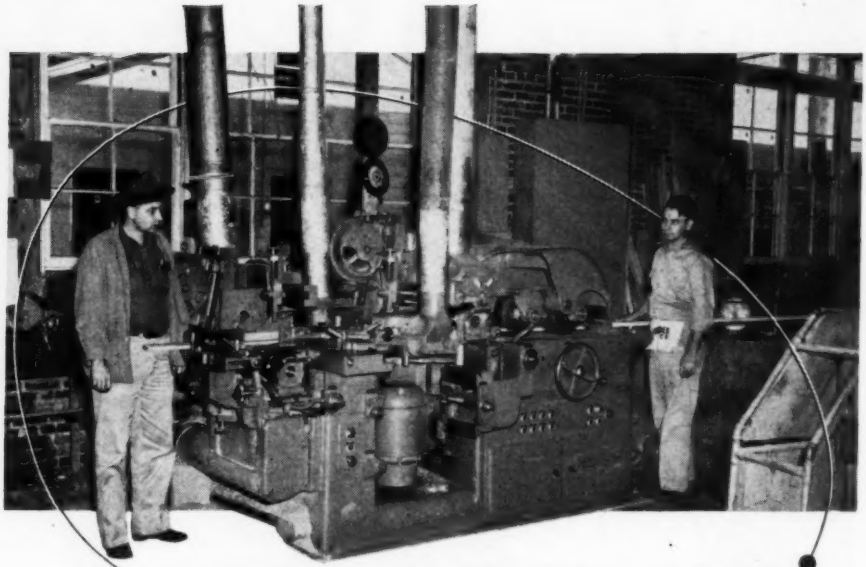
## L. POWER & CO.

**2823 Oakford St.**
**Philadelphia, Pa.**

*Manufacturers of POWER Machinery Since 1867*



# NEW MACHINERY IS A GOOD INVESTMENT!

## *Users say...*

". . handled doubled sales volume with absolutely no additional overtime on the moulder . ."

". . we are able to make as many as fifteen to sixteen different set-ups a day . ."

". . proved to be a most worthwhile investment . . . increased the volume of work . . . improved quality . . . minimum operating expense . ."

". . increased our production . . . sanding operation cut in half . . . same amount of work as on two older machines . ."

". . machine is doing excellent work . ."

". . now doing on this machine work done on 2 machines of another make . ."

". . machine man likes ease of changing speed without use of frequency changer . ."

". . saves approximately 1/3 of production time and 1/3 of set-up time . . . able to get nicer work . ."

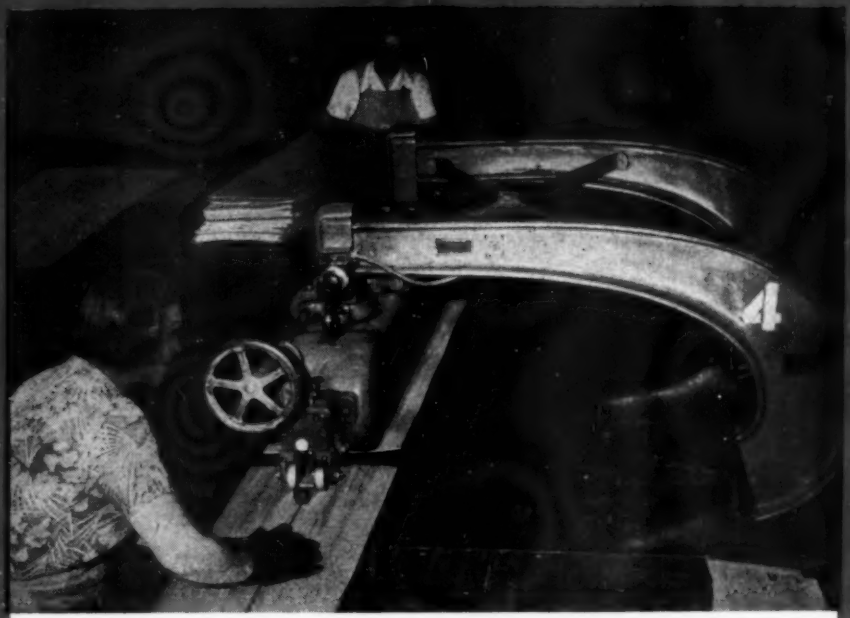
**(Excerpts from actual letters on file. Names on request.)**

## EKSTROM, CARLSON HI-SPEED MOULDERS

Check your costs and see if it wouldn't *pay* you to invest in new machinery like this. ECCo Hi-Speed Moulders have cutter speeds adjustable from 3600 to 7200 rpm *without use of frequency changers.* Jointing of cutter heads for high-speed work is an easy operation. Feed rate is quickly and continuously adjustable between 25 and 225 fpm. All in all, ECCo Hi-Speed Moulders offer you many money-making opportunities—get the full information as it applies to *your* operation.

**EKSTROM, CARLSON & CO.** ECCO **1411 RAILROAD AVE., ROCKFORD, ILL.**

MOULDERS • SANDERS • ROUTERS • SHAPERS CARVERS • PANEL SIZERS • GROOVERS



# UFORMITE JS-508 splicer glue gives wide assembly time

UFORMITE JS-508 is a one-component urea-formaldehyde resin adhesive which gives you wide latitude in assembly time in splicing veneers. Veneers spread with UFORMITE JS-508 may be spliced immediately, or they may be held for as long as three days before joining. This unique feature greatly simplifies glue room procedure, and avoids problems during weekend shutdowns.

UFORMITE JS-508 has other important advantages. When properly stored, it has a shelf life of up to one year. It disperses readily in water. It has a pot life of 8 to 12 hours; a whole day's mix can be prepared at one time. UFORMITE JS-508 does not dust.

For a generous working sample of UFORMITE JS-508, write to department RG-2.

CHEMICALS FOR INDUSTRY

**ROHM & HAAS COMPANY**

THE RESINOUS PRODUCTS DIVISION

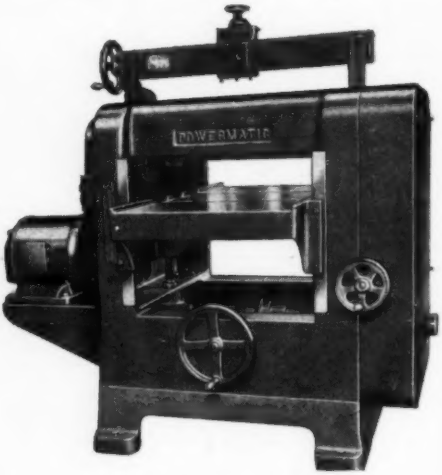
Washington Square, Philadelphia 5, Pa.

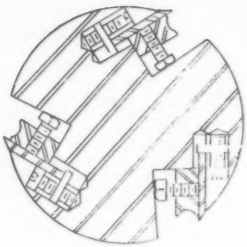
*Representatives in principal foreign countries*

UFORMITE *is a trade-mark, Reg. U.S. Pat. Off. and in principal foreign countries.*

# Production Problem?

# POWERMATIC has the answer



*The Powermatic E-16" Planer comes standard equipped with "jack screws" in the cutterhead, allowing quick easy adjustment of knives in a minimum of time.*

**POWER - SPEED - ACCURACY best describe the Powermatic Model E-16 16" Planer. This heavy duty machine is designed especially for production work, but produces finishes fine enough for the most particular cabinet maker. The E-16 features an exceptionally heavy cast iron frame with one piece cast iron base. Frame has extra wide side panels with gibs to support planer bed. The 3 knife safety type cutterhead has a 4" cutting circle and is fitted with high speed steel knives. Feed rolls are 2-3/16" in diameter having 5/8" yield. The chipbreaker swings concentric to the cutterhead and fitted close to the knife cutting circle. A complete range from 15 to 37 feet per minute is offered with the use of Variable Speed Pulley.**

***DEALERS IN ALL PRINCIPAL CITIES***

*Complete information sent upon request.*

*Manufactured by*

## POWERMATIC MACHINE CO.

**McMINNVILLE, TENN.**

Black & Decker electric screw drivers mean faster, more accurate, dependable work ... and they're

# POWER-BUILT TO LAST!

This Black & Decker No. 8 Scrugun®, one of 21 B&D Screw Driver models, typifies the *power*, *speed* and *accuracy* of all B&D tools! Automatically drives screws to uniform tightness (up to No. 8)! Choice of paddle or toggle switch. *All B&D Screw Drivers* are light, perfectly balanced—cut operator fatigue, reduce slippage, marring! Your choice of positive or adjustable clutch, 90° angle heads for close-in work (optional)! For more information write: THE BLACK & DECKER MFG. CO., Dept. 2712, Towson 4, Md.

## Service

...one of 42 Black & Decker factory service branches is located "next door" to you. Staffed by experts to give fast, efficient service, genuine replacement parts.

## We don't buy motors— we build them!

The *heart* of your electric tool is the motor—completely built by Black & Decker! All the power you need *and then some*—because each motor is built for a specific tool and the job it must do! B&D motors always *stand up!*

LOOK IN THE YELLOW PAGES UNDER "TOOLS-ELECTRIC"

Drills • Sanders • Saws • Grinders • Glue Pots • Black & Decker makes a complete line of portable electric tools.

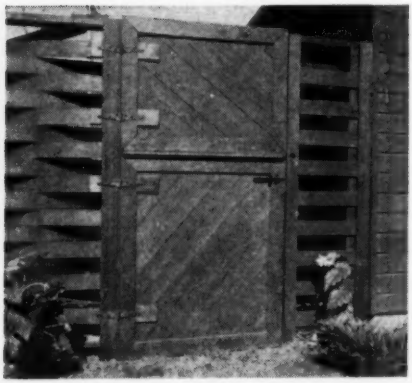
Black & Decker®

PORTABLE ELECTRIC TOOLS

# Shop Grade California REDWOOD

## *for Durable, Economical Fences*

Today's trend toward outdoor living has made Americans fence-conscious... and provided the wood worker and millworker with new opportunities for production and profit, in rough and finished fencing, pre-fab sections and gates.

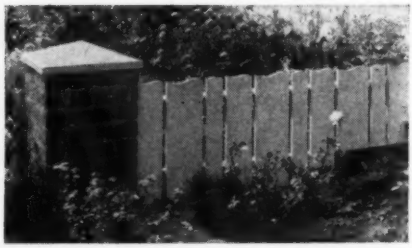


**UNUSUAL "DUTCH-DOOR" Redwood gate on rustic woven fence of Redwood.**

California Redwood—highly resistant to decay, warping, weather and termites—is the perfect material for fencing. Shop-grade Redwood is an economical source of heartwood cuttings for use in direct contact with the ground. It will also produce sapwood cuttings for use above ground.

For full data on Redwood fences, write the California Redwood Association, 576 Sacramento Street, San Francisco 11, California.

Included in the Association are sixteen of the nation's top Redwood lumber mills: The Pacific Lumber Co., Rockport Redwood Co., Simpson Redwood Co., Union Lumber Co., Warm Springs Redwood Co., The Pacific Coast Co., Willits Redwood Products Co., Wolf Creek Timber Co., Inc., Arcata Redwood Co., Eureka Redwood Lumber Co., Hammond Lumber Co., Hollow Tree Redwood Co., Holmes Eureka Lumber Co., Hulbert & Muffly Lumber Mill, M & M Wood Working Co., Northern Redwood Lumber Co.



**COLONIAL PATTERN low board fence, designed and painted to match house, will hold its finish for years.**

**COSTS WERE KEPT LOW on this modern, decorative nursery fence by using shop-grade Redwood for short cross-braces.**

# Machines were not meant to be "loafers"!

Are your steel knives making "loafers" out of your machines? "Down-time" is costly, wasteful, inefficient—and unnecessary.

Unnecessary because Marcoloy Carbide Knives can eliminate practically all "down-time" on your machines. They stay sharp many times longer than steel knives—so that your machines will keep right on producing—instead of "loafing" while steel knives are being sharpened, maintained, or tested.

### "DOWN-TIME" IS COSTLY

A "loafing" machine is expensive three ways: (1) an expensive capital investment isn't working (2) labor employed in maintaining knives is "non-productive" and (3) "lost" production is expensive and wasteful.

### INCREASED FEEDS TOO!

Not only do Marcoloy Carbide Knives cut out "down-time," but they frequently make it possible to *increase the feed of the machine*, hence increasing production again.

Because every Marcoloy knife cuts, the quality of work is uniformly good. And Marcoloy Knives bring your maintenance costs down, down, down!

### PAY FOR THEMSELVES

Best of all, they frequently pay for themselves in savings over a few months.

We don't claim they'll solve all your problems, but they can and will solve your "knife-wear" problems.

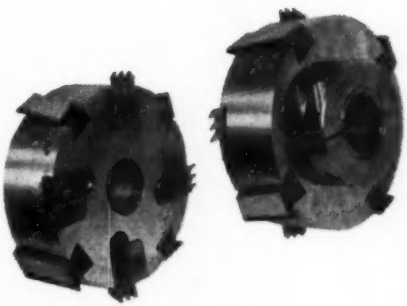
Why don't you write us about one of your knife-wear problems. There is no obligation for our recommendations.

## NEW! All-Carbide TENON HEADS

These recently developed Marcoloy Carbide Knives for tenoners are real cost cutters. They'll cut out the down-time on your tenoners—and do better work. Note these features:

(1) Helical carbide knives give shear cut
(2) Adjustable solid carbide spurs with safety lock; infinite adjustment
(3) Self-centering and locking head
(4) Dynamically balanced for smooth running

*These tenon heads will pay for themselves in savings. Send us your specifications for a quotation.*



**Investigate the MARCOLOY CARBIDE SYSTEM**

MARCOLOY CARBIDES

**MARCOLOY, INC.**
**Springdale, Conn.**

# Diehl Cutterheads

## L-O-N-G on quality!

Don't you buy cutterheads for just one reason —to make all the money you can from your investment? Diehl Cutterheads are l-o-n-g on quality . . . made of the best obtainable steels, correctly heat treated, accurately ground to the closest limits. Each Diehl Cutterhead is backed by Diehl's 46 years of experience and by engineering facilities unsurpassed in the woodworking equipment industry. See your Exclusive Diehl Representative soon for proof of the l-o-n-g quality—and l-o-n-g-e-r profits—you get with Diehl Cutterheads. Or write for Bulletin No. 452. **The G. M. DIEHL MACHINE WORKS, INC., Wabash, Indiana.**

***Standard of Comparison in the Woodworking Industry***

**CUTTER DIVISION**

**Diehl**

# The Editor's Page

Christmas is a time for giving. This editorial is being written in mid-November. However, even this early our friends and families are busy with Christmas preparations. What to make . . . what to buy . . . what to give!

The stores in nearby Chicago are filled with early shoppers. By the time you receive this issue of WOOD WORKING DIGEST, your own Christmas plans will probably be well formulated.

Yes, Christmas is a time for giving. Gifts for friends . . . gifts for business customers . . . gifts for those we love best . . . and gifts for those who may have no one else to give to them. I hope and wish for every fellow worker in the woodworking industry that some part of your joy may be giving to the less fortunate. If you have never done so before, make it a part of your family planning to include those you do not know and may not actually see in sharing Christmas cheer.

Within the next several weeks, office parties and company celebrations will claim the time of many of us. Christmas is a time for giving. Not only gifts, but those intangible things such as friendship, joy and a warm good feeling of happiness.

May the gifts under your tree and within your heart be those you most desire. May this Christmas truly be a joyful one for you and your family.

Christmas is a time for giving: it is and always has been. Fill your heart with loving kindness toward friend and neighbor and think again of the first great Christmas Gift. May He who gave that Gift, keep you in His care.

*"For God so loved the world that he gave his only begotten son, that whosoever believeth in him should not perish, but have everlasting life."*
*—John 3:16 (The Bible).*

E. McDaniel
Editor

# LARGE FANS Like This In Modern Moore Cross-Circulation Kilns Give PRODUCTION DRYING at LOW COST

Large multi-blade Moore Fans are *dry kiln fans* — designed and manufactured in our own plants for Moore Cross-Circulation Kilns.

These fans deliver a greater, more uniform circulation through each sticker course, producing more cubic feet of air per HP.

**You Get MORE — With MOORE**

**MOORE DRY KILN COMPANY**

Oldest and Largest Manufacturers of Dry Kilns and Veneer Dryers

JACKSONVILLE FLORIDA · BRAMPTON, ONT. CANADA · VANCOUVER, B. C. CANADA · NORTH PORTLAND OREGON

# Comments

## FROM THE NATION'S CAPITAL

By **Arnold Kruckman**
Washington Correspondent

Last month we enumerated 43 basic groups of wood products listed for tariff consideration in Washington and at Geneva. These groups represent between 400 and 500 separate products produced by the woodworking industry. Sometimes, if rarely, some of the individual items are listed for discussion and consideration before the Tariff Commission and the Committee on Reciprocity and finally at Geneva. The story is told by the briefs filed and the arguments presented on behalf of the wood interests during October and November which were covered by attention to five broad subjects.

In connection with a possible reduction of duties of Douglas fir plywood, Cascades Plywood Corporation, on behalf of themselves and several other manufacturers of Douglas fir, filed a protest against a reduction of the U.S. duties. This was presented as a brief.

The American Wood Fabric Institute, on behalf of its industry, filed a protest gainst reduction of tariff duties on woven wood fabrics and woven wood fabric products.

The National Woodwork Manufacturing Association filed a brief protesting reduction of tariff duties on flush doors and all other doors.

The Flat Veneer Products Association protested against any reduction in the duties levied on wooden forks and spoons.

The Diamond Match Company filed a brief protesting any reduction on the tariff on matches.

It is of course conspicuously obvious that other items connected with lumber and wood products, which have been the subject of a great deal of discussion in the past months by reason of the complaint that the duties should not be lowered, did not come into the program during the October-November oral or written debate before the Tariff Commission and the State Department. It is assumed in Washington that the woodworking

and lumber industry felt it would be wise to do and say as little as possible. They had already strongly made their protests. It was felt that further insistence at this time in a public hearing might not work to the best advantage of the industry.

Under normal circumstances, if an item does not appear on a list, it is not eligible for more detailed consideration. Therefore, if there is no further discussion of any of these much debated items, such as hardwood plywood and Philippine mahogany and the others, there may be very cursory discussion in Geneva.

Diplomacy, however, is both involved and tortuous. It is not at all certain that with the end of the filing of briefs and formal discussions before the Tariff Commission and the Committee on Reciprocity, that the subject has been closed as far as the Tariff Commission and the State Department are concerned. Any of the foreign governments concerned with the tariff and duty questions who are not satisfied may file a protest and reopen the subject before the American delegation goes to Geneva. Obviously, we can do the same and file similar proceedings against our foreign opponents in their own countries in order to bring the subject before the Geneva conference.

It remains to be seen what is done between now and the time the American delegation leaves for Europe. Incidentally, no one seems to know just exactly who will represent the lumber and woodworking interests at Geneva on the part of our Government. The assignment is not popular. Geneva is a pleasant place for a reasonably short stay; but this assignment means that whoever goes will have to stay until the beginning of summer. The law requires that the questions to be settled must finally find their answers by June 30, 1956. At that time the American delegation working on the GATT problems must have finished its job and must be ready to come back and report to Congress and to the President.

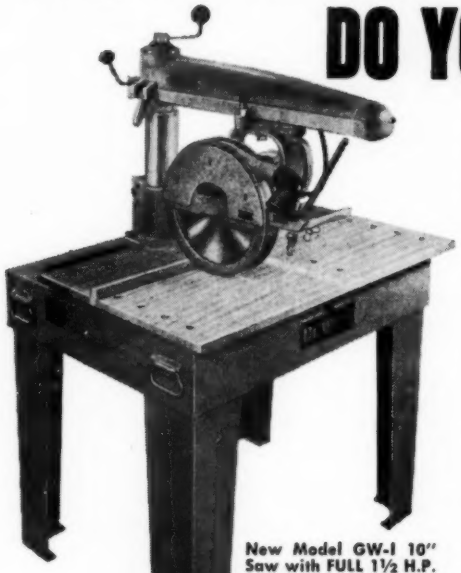
Another important consideration is that those who are sent as delegates are allowed a certain legal over-all appropriation for travel and for their personal expenses. The sum involved is never, by any stretch of the imagination, sufficient to cover the outlay which the members of the delegation individually must meet. It is for this reason that the assignment to Geneva on the GATT business is scarcely attractive to the average bureau chief or other expert who almost invariably must live on his salary.

It should be borne in mind that besides the members of GATT -25 of them-it is anticipated other countries will be at Geneva to participate in negotiations, negotiating among themselves- which means that the United States unquestionably will be asked to negotiate on tariffs covering the export and import of lumber and wood products with countries that are not yet known as potential negotiators.

In the forthcoming negotiations at Geneva the wages of those who produce the wares will be among the important

# You may have spent enough to pay for an AMF De Walt machine... but

# DO YOU OWN ONE?



New Model GW-I 10" Saw with FULL 1½ H.P. Motor . . . complete for only $395 DELIVERED (custom-built 1½ H.P. motor, 10" saw blade, 4 detachable steel legs included)

Even if you've invested as little as $239 in shop equipment you may not be enjoying the profit-making benefits of a DeWalt®. We invite you to compare your present equipment and shop methods with these AMF De Walt features and operating advantages:

- One low-cost machine that does ALL the work of a swing saw, straight line cut-off and miter saw, table-type rip saw, dado machine, shaper plus many others.
- Savings of up to 60% or more in capital equipment investment alone.
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**LOOK AT THESE OTHER AMF DEWALT ADVANTAGES!**

- Top-side Cutting for Safest Cutting
- 90% Savings in Layout and Marking Time
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DE WALT POWER TOOLS

Lancaster, Penna.

SEND FOR *FREE* NEW IDEA BOOK ON INDUSTRY! 16 pages packed with illustrations. Shows you dozens of ways to cut costs on cutting jobs, time-motion study.

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considerations. It is expected submissions may be presented concerning wages which are substandard in the exporting country in accordance with the policy recommended in the President's message to Congress, March 30, 1954, relating to avoidance of concessions in such cases.

AFL-CIO have already forcefully brought to the notice of the White House, the Congress, the State Department and the U.S. Tariff Commission that unemployed workers in U.S. depressed areas should not be harmed by the tariff policies of this nation. It has been demanded that guarantee of minimum labor standards be made a part of all agreements to grant tariff concessions to other countries.

It has been requested (1) every effort should be made not to grant tariff concessions on articles which are important to the economy of depressed areas; and (2) foreign markets should be opened for products of depressed areas by seeking reduction in the tariffs of other nations on such products.

AFL-CIO points out despite the decline in unemployment for the nation as a whole during recent months there are still a considerable number of localities in which a large proportion of workers are unable to find jobs.

Department of Labor reported as of September 30, 1955 there are twenty-six major areas and ninety-four smaller areas with a substantial labor surplus, with 6 percent or more of the labor force unemployed.

The Secretary of the U.S. Department of Health, Education and Welfare has reported to Congress surplus property which includes considerable school and office furniture. Most of the property comes from the Department of Defense. The property is available for sale to non-profit institutions exempt from Federal taxes.

The Forest Products Division, of the Business and Defense Services Administration, U.S. Department of Commerce, reports during 1954 we exported nearly 1,900,000 crossties, 12% less than was shipped in 1953. West Germany took the largest quantity in early 1955. South Korea took the second largest quantity; Mexico was third, and the United Kingdom fourth; Austria was fifth and Canada sixth.

The Union of South Africa, which has always been a strong U.S. tie customer, bought very few in 1955.

For the time ahead it reports that the Egyptian Republic is purchasing a half million creosoted oak or Southern pine crossties from the United States.

It is interesting to learn that Cuba, Peru, Bolivia, Colombia, Great Britain, Greece, Pakistan, India, Thailand, Iran, Saudi Arabia, Jordan, Syria, are acting together in buying a large quantity of ties.

The American Forest Products Industries report that the railroads and utility companies are the largest users of treated wood in the United States.

IF YOU WANT BETTER FINISH...
LESS WASTE... MORE ACCURACY...
HIGHER PROFITS...

# You'll want NEWMAN MACHINES

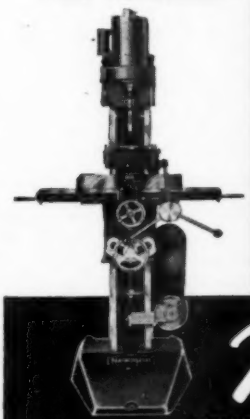
*Geared to YOUR production*

S–824 SINGLE SURFACER

K-16 VARIETY SAW

G-232 HYDRAULIC KNIFE GRINDER

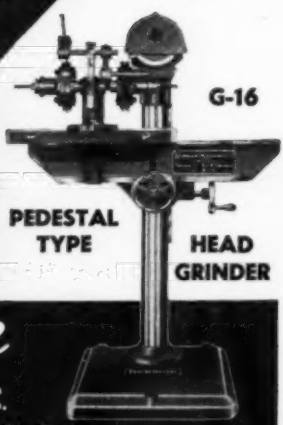
T-20 MORTISER



The machines shown here are but a few of those manufactured in our big new modern plant which turns out a full line of up-to-the-minute woodworking machinery. Our staff of design engineers constantly seek newer, finer techniques and quality controls. All moving parts — shafts, pulleys, heads are dynetrically balanced for smooth vibration-free service and long productive life. Full details of any Newman Machine is yours on request.

– – Write today – –

Remember you'll always get more profit dollars from Newman Machines – – Geared to your production.



G-16 PEDESTAL TYPE HEAD GRINDER

Newman MACHINE CO., INC.

GREENSBORO, NORTH CAROLINA, U. S. A.

Crossties require the largest volume of treated timbers, requiring 103,812,440 cubic feet, or 33,011,874 crossties; poles required 62,679,065 cubic feet; lumber and timbers 35,504,798 cubic feet.

The wood preserving industry of the United States provides employment for some 14,000 persons with salaries and wages amounting to $40,000,000 a year. In 1953 the products of the industry were valued at $332,595,000.

Israel's Embassy in Washington announced recently over 1,000 guests attended the planting of the first pine and cypress saplings in the Queen Elizabeth II Coronation Forest in the hills of Nazareth. The Queen sent a message expressing the hope that the forest would "flourish as a symbol of the friendship which links my peoples and the people of Israel."

"Peckerwoods," around Crawfordsville, Georgia, are in distress because the very small mills, which travel from place to place, under contract from some big operator find that the new minimum wage laws make it impossible for some of them to operate.

As is well known, the minimum wage level has been boosted from 75¢ an hour to $1. The two bits hourly increase, effective March 1, 1956, looks like a mountain to them. They have sent several delegations to Washington to see what can be done. Practically all of the population of one thousand around Crawfordsville, Georgia, get their principal support through the 400 odd lumber workers, including the force employed at the planer mills. One of their troubles is when the time comes when they must raise the 75¢ minimum to $1 they also must raise other wages to $1.25, and the social security taxes also will go up.

The U.S. Department of Agriculture announced the timber harvested in national forests during the year ending June 30, 1955, was highest on record. The total cut was 6,328,229,000 board feet, compared to 5,365,113,000 feet cut during the previous year. The value of the cut is estimated at $70,760,440. Many factors contributed to the increased timber harvest; a stepped-up road-building program; light snowfall in many forests permitted logging for a longer time; and the timber market continued strong.

The National Wooden Box Association of Washington, D.C., was among eighty-seven exhibitors of packaging and materials handling equipment at the Tenth Annual Exposition held September 20-22 at the Kingsbridge Armory, Bronx, N.Y., under the auspices of the Society of Industrial Packaging and Materials Handling Engineers. Between 7,000 and 8,000 representatives of American industry visited the Exposition. The National Wooden Box Association exhibit included a wide range of products of the wooden box industry. Many visitors requested special information relative to available types of wooden boxes and crates.

*Coming Next Month . . .*
*Special stories on particle board and a tour through a veneer plant*

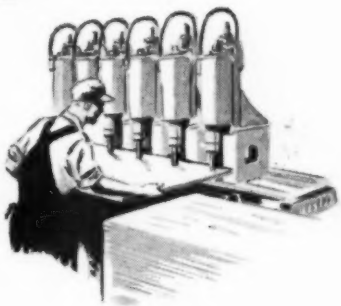
# Cushioned Power FEED

## with the Bell no. 80 multiple head mortiser

"Cushioned Power" feed enables the machine to "feel" its way through cuts . . . hurrying on soft cuts . . . slowing slightly on hard cuts. Cushioning effect of feed promotes greater accuracy, relieves strain (when meeting unequal resistance) and eliminates over heating of chisels, chains and bits.

### VERTICAL

Vertical design saves floor space and allows material to be worked on a *horizontal table* in a *natural position* at a *convenient height* for operating comfort.

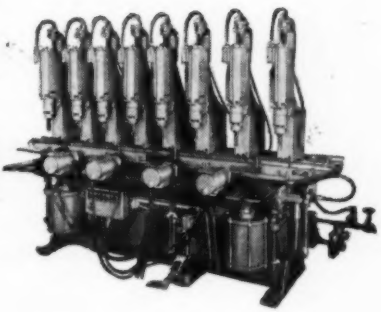


### VISIBLE

"Blind" guesswork is completely eliminated. Working tools and material are in plain, unobstructed view of the operator at all times . . . *increasing accuracy* and *volume* of production.

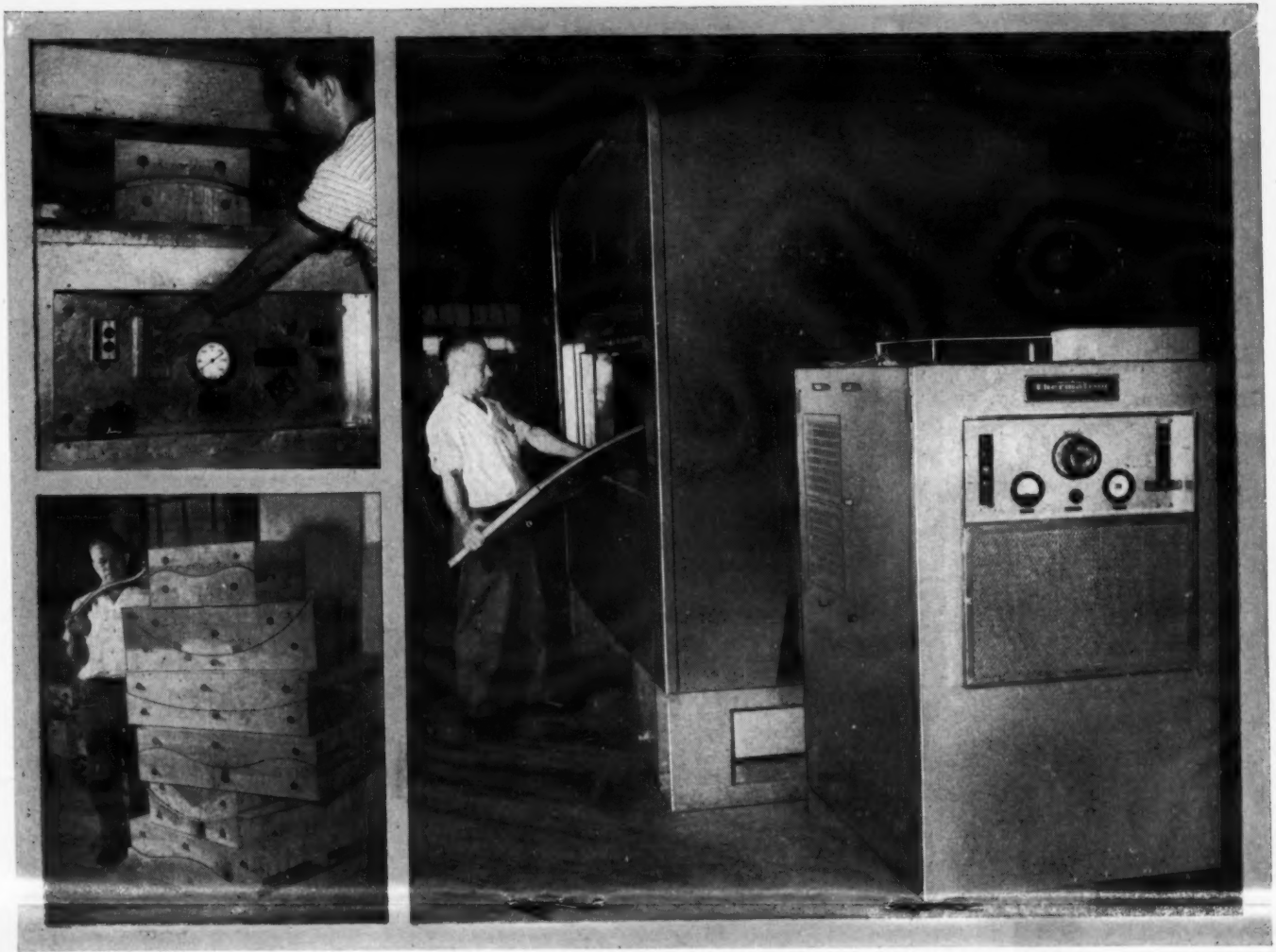
### VERSATILE

The Bell No. 80 makes it possible to cut hollow chisel mortises, chain mortises and bore all in one operation, or in any of the individual operations. Write for additional details.



**Bell** WOODWORKING MACHINERY

**The BELL MACHINE COMPANY** 71 Jackson Drive Oshkosh, Wisconsin



## Now Pennsylvania Furniture Co. bends and laminates fine veneer serpentine fronts in a fraction of the former time with THERMATRON

The old method of gluing in a cold press used to require almost three hours, but the THERMATRON high frequency installation in Pennsylvania Furniture Co.'s York, Pa. plant has created a revolution! Using the 15 KW output THERMATRON generator and 225 ton plywood forming press illustrated, as many as several layups of six to ten pieces of veneer are precision bent and laminated at once over their inexpensive hardwood moulds . . . And the time cycle is no more than 2¾ *minutes*. Other than loading, it's a push-button operation throughout, with no special skills required.

We'd like to survey *your* present operation. We can prove that THERMATRON high frequency equipment will do a superior job while it slashes away at costs. Frees large drying areas for more profitable purposes, too. Write or phone us now without obligation — And ask for our latest bulletin WD-53

*Thermatron Division*

**RADIO RECEPTOR COMPANY, INC.**

*In Radio and Electronics Since 1922*

Thermatron

HIGH FREQUENCY SEALING AND HEATING EQUIPMENT

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OTHER RADIO RECEPTOR PRODUCTS: Radar, Navigation and Communications Equipment; Selenium Rectifiers; Germanium and Silicon Diodes

# POINTED PARAGRAPHS

**The A.S.M.E. Wood Section, and the Forest Products Research Society conducted very successful meetings in Chicago during November. Particle board—manufacture and use—were discussed by both groups. Watch for articles on the subject in later issues.**

*The Fir Door Institute has decided to suspend for a time. Competition from other types of doors and lack of full support from all of the manufacturers are two of the reasons.*

**Special exhibits at the 1955 annual meeting of the National Lumber Manufacturers Association and its research affiliate, the Timber Engineering Co., in November, showed some unusual "wood." "Concrete boards" and "wooden bricks" were among the displays as well as a demonstration which tested wood by sound waves. "Concrete boards" are made with a combination of wood excelsior and Portland cement. "Wooden bricks" are a product of the short and narrow pieces of wood that are leftovers in many operations.**

*National Retail Lumber Dealers' Association held a successful meeting in Cleveland during November. Among interesting products were the self-service educational displays for dealer use.*

**The United States Department of Agriculture has issued a report on the most complete survey of timber resources ever made. The nation's timber requirements are expected to be so high by the end of the century that timber growth will need to be from 70% to 120% greater than it is now.**

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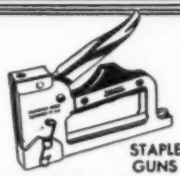
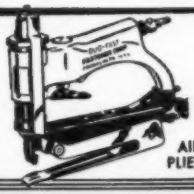


STAPLE GUNS

STRIKE TACKERS



AIR PLIERS

## FASTENER CORPORATION

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The report, "Timber Resources For America's Future," is available from the Forest Service, U. S. Department of Agriculture.

*With the great surge upward in church construction, it is interesting to note that three out of every four new churches have roofs of engineered timber construction.*

Donald G. Shook, Washington, D.C., has been appointed deputy director of the Forest Products Division, Business and Defense Service Administration, U. S. Department of Commerce.

*Seventeen of the leading manufacturers of TV and hi-fi radio-record player units are now using the new "genuine hardwoods" seal, reports the Fine Hardwoods Association.*

Business next year will be even better than this year, with greater output, higher wages and higher prices in prospect. This report comes from The F. W. Dodge Corporation in its annual curve of economists' opinion.

*Forest rangers have a new fire-fighting ally in a recently announced "electronic firewatcher." The instrument was demonstrated at the Forestry Conservation Communications Association Convention at Charleston, S.C.*

The October 31 issue of "Life" had a splendid article, "Comeback in the Woodlands." This information may not have been new to those of us in the woodworking industry, but there was great value in having this article present wood harvesting, utilization and research to the public in such an attractive form.

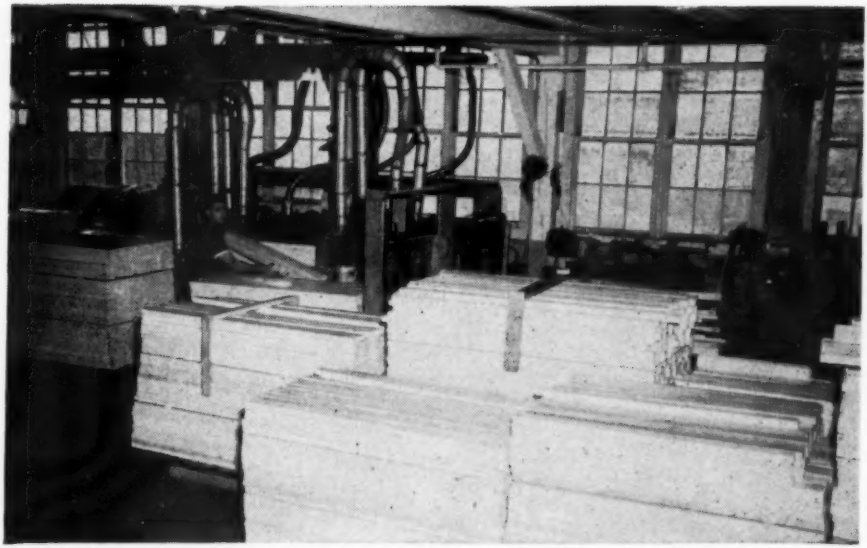
*Straw and aluminum are getting a tryout as homebuilding materials. In Sweden, wheat and rye straw were pressed into board and used to construct 10 houses.*

The forty-sixth annual forestry conference will be held December 7, 8, 9 at the Multnomah Hotel, Portland, Oregon.

*Market dates: January 5-18, for the Grand Rapids Winter Furniture Market. Chicago market, January 9-20.*

Concern over consumer credit is about the only shadow on the 1956 business horizon. Brakes, however, are being applied slowly but surely.

*Be sure to read Tom Perry's fascinating story on the erection of an electronic transmitter and relay station on Mt. Washington, New Hampshire.*



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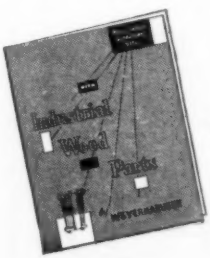


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## New developments from Diehl:

Shown above is one of three new Diehl 12" Moulders at American Furniture Company, Martinsville, Virginia. R. (Bob) L. Whitener, Plant Supt., reports, "We replaced five moulders with three new Diehl Moulders and **with four less people we have production increase of 28.6%.**"

**Here are just some of the significant design modifications available in the new 12" moulder.**

- New spring pre-loaded bearings in spindles to eliminate both end and radial play.
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- Air controlled feed roll pressure system.
- Separate electrical control panel and new style switches with electrical brakes.
- Double-tapered detachable spindles for top and bottom heads.
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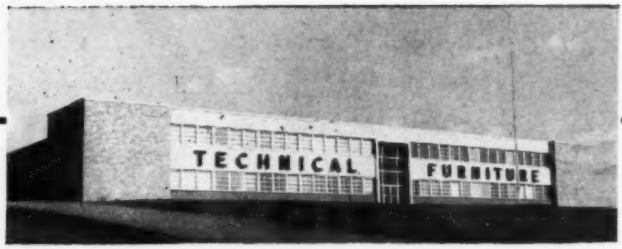
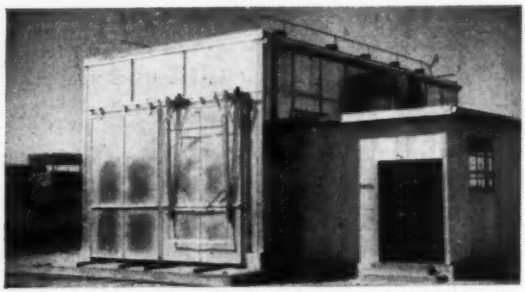



# AGAIN, TECHNICAL CHOOSES STANDARD!

• The Technical Furniture Company has purchased a *second* Standard Prefabricated Dry Kiln for its new plant in Statesville, N.C. Like the first (shown below), it provides high performance and complete control of temperature and humidity conditions. Circulation of air is effected by Standard's well-known direct-driven, internal-fan system . . . *used successfully for years in thousands of installations!*



Technical's two Standard Prefabricated Dry Kilns have doors at both ends. Each kiln will hold approximately 20,000 bd. ft. of lumber. All kiln controls are located at the side, at ground level.

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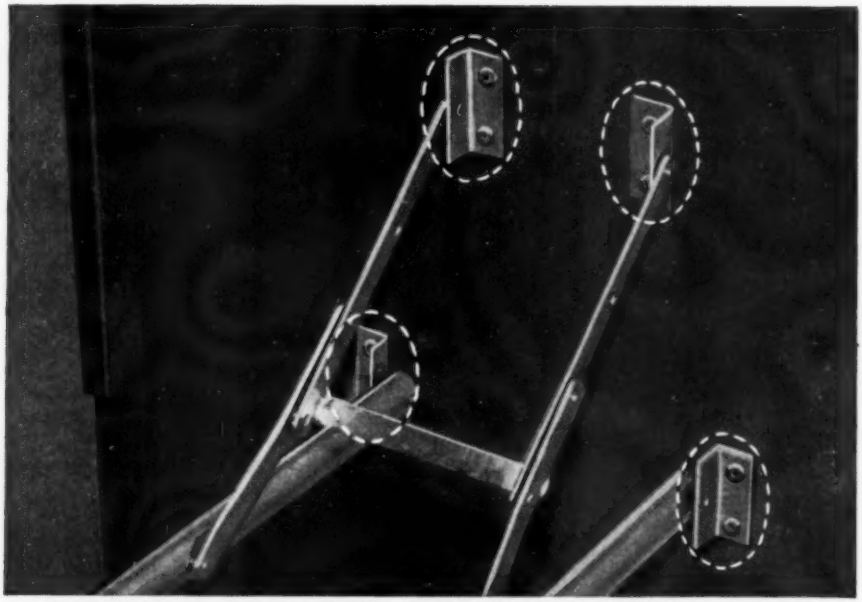

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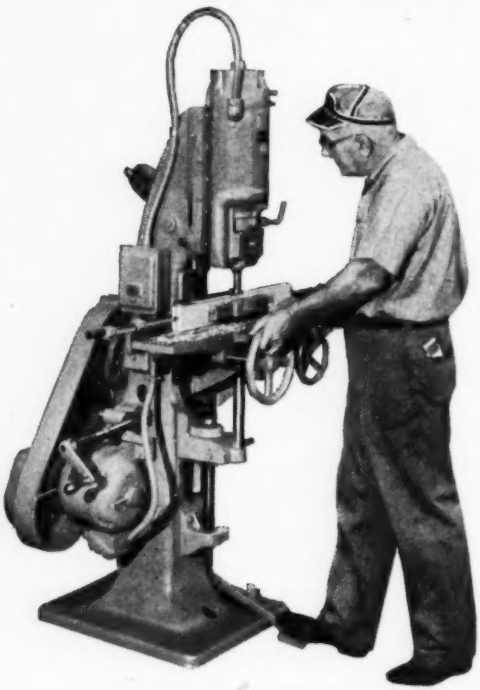

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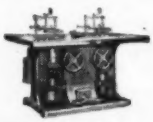

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# Fundamentals of WOOD MACHINING

By Carl Chekouras

MOST lumber has to be planed. Some material is planed when it is still in the wet stage, some after drying and some after kiln drying. The condition of the wood at the time of planing has much to do with the type of planer to be used for the finish. To note the two extremes: a cabinet surfacer used for the fine finishes is not qualified to do roughing work such as the manufacture of 2 x 12's or other dimension stock. It can further be added that the finishing surfacer is, as we shall see later in this chapter, a different machine than the roughing planer.

The principle of planers includes a mechanism that holds the stock flat and feeds it through or under a cutterhead that, while revolving, removes an equal amount of shavings cutting the surface flat. Of the many types of planers the basic principle remains the same—a set of feed rolls feeding the stock under a cutterhead or between two cutterheads.

## *PLANERS AND MATCHERS*

In the manufacture of dimension material the need for having definite widths has become almost universal, thereby requiring that the planer be equipped with side heads for dressing material to a given width. Having side heads on a machine, it has been found that such a machine could do other operations, such as machining edges rather than just cutting patterns. S4S, bevel edge, round nosing, tongue and groove, spline joints and many other patterns can be cut with the side heads while the top and bottom heads are planing the stock to a standard thickness. Here are some of the many patterns that are machined on the edges of boards at the time the surfaces are being planed.

Although the term matcher has been misused, the true definition of a matcher in most instances is a heavyweight machine primarily for the manufacture of boards of a given dimension or pattern. The top and bottom cutterheads of a matcher are referred to as cylinders and are usually fitted with from 2-24 knives, according to their expected output. The knives are mounted in the cutterhead according to the desired cutting angle, which is determined by the species and moisture condition of the wood to be planed. Although there are many different cutting angles required, it is not practical to change cutterheads in a matcher just

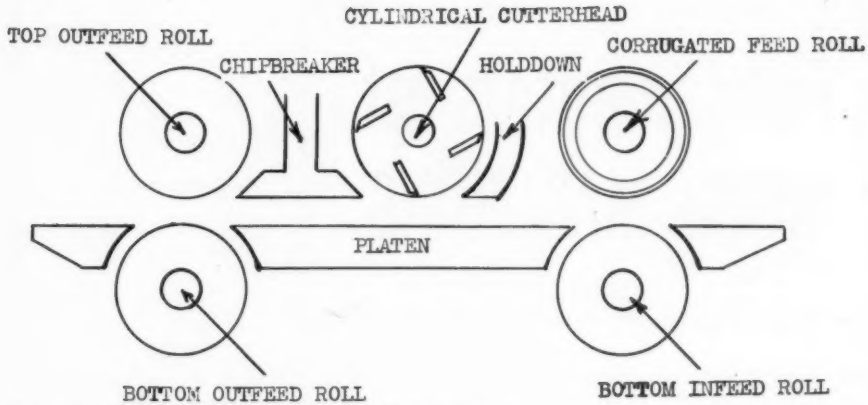
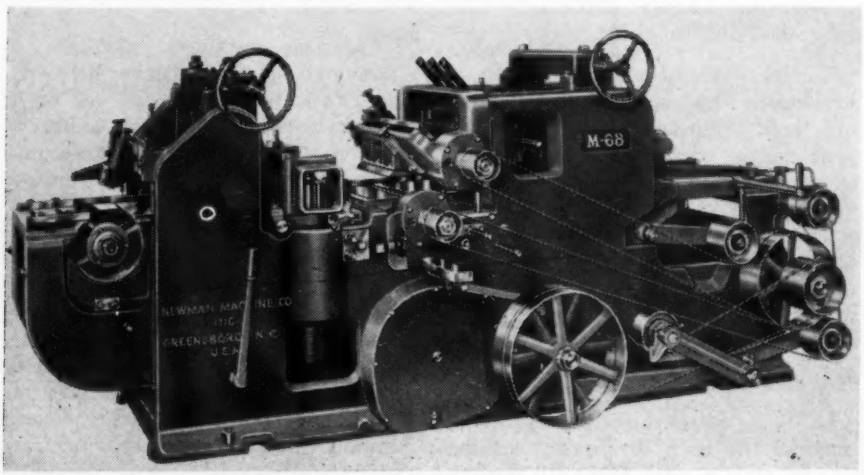



*Fig. 1. Sketch showing the basic principle of a planer.*

to manufacture a few pieces of a different species of wood.

A chart of cutting angles for the varied species of wood appears in this article. The various conditions designate the average rather than the specific cutting angle required.

To further explain the matcher, the machine is equipped with power driven feed rolls that feed the stock in between top and bottom cylinders. The cylinders surface the top and bottom faces of the stock and from there the stock is advanced between side heads that either cut the edges square or machine a pattern. The versatility of the matcher has been increased by the addition of top and bottom profile spindles upon which various cutterheads can be mounted to machine other features in




Courtesy Newman Machine Company.
*Fig. 2. Modern belt driven planer-matcher with bottom profile head.*

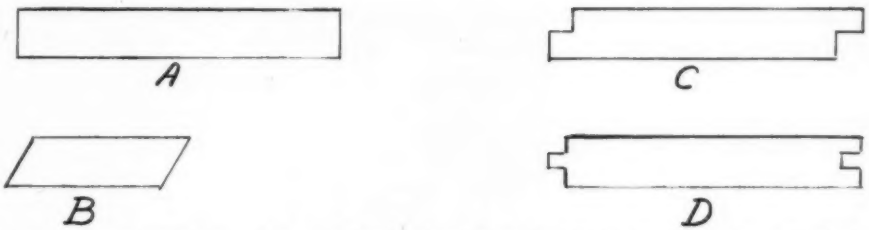



*Fig. 3. Typical patterns cut by side heads of matcher: A. S4S (surface four sides); B. Corn crib slats; C. Shiplap; D. D. & M. (dressed and matched).*

the flat surfaces of the stock. It is from this application that we get such patterns as drop siding, wainscoating, car siding and many others.

The profile heads are added to the outfeed end of the machine. In most instances a machine equipped with profile heads has a top and bottom spindle that can be equipped with a cutterhead or a combination of cutterheads that will machine the pattern into the faces of the stock.

Primarily the matcher is used for the manufacture of lumber and dimension material, but it also can be used in finer work if the machine is in good condition. It is known that many good matchers have produced such items as quarter round, interior trim, door stops, door frames, thresholds and many other such patterns to a great advantage. This can be done by employing the profile heads, or, in some instances, the matcher is equipped with a combination cylinder permitting the attachment of pattern knives that will cut a feature into the pattern at the same time the material is being surfaced.

## FLOORING MATCHER

Although flooring has been manufactured on standard matchers, it is best to machine flooring on a machine especially designed for that work. For such work the flooring matcher is used. Similar to the standard matcher, the flooring matcher provides an extra top head for machining the hollow back portion of the flooring as required for that pattern. The machine usually has an embossing roll that prints the manufacturer's name and perhaps the flooring association initials into the hollow back portion of the flooring. The side heads of a flooring matcher are fitted to the side spindles. In most instances the cutterheads, commonly known as expansion matcher heads are used. Expansion matcher heads are designed to be adjusted so that the tongue and groove of the flooring can be controlled.

The material is advanced into the machine by a feeding mechanism, and continues through between the top and bottom cylinders. From there it is advanced to the side heads where the tongue and groove cuts are made. Between the side heads the holddown roll (also used to emboss) holds the stock firmly to the bed of the machine to insure accurate cutting of the tongue and groove. The flooring is then fed out of the machine by power driven feed rolls.

At one time a machine was manufactured that produced flooring in a different way. That machine produced the tongue and groove on the top and bottom heads, the back and hollow

| SPECIES OF WOOD | KILN DRIED Cutting Angle | AIR DRIED Cutting Angle | GREEN Cutting Angle |
|---|---|---|---|
| Ash (figured) | 30 | 25 | 30 |
| Ash (plain) | 25 | 25 | 30 |
| Bass wood | 20 | 15 | 20 |
| Beech | 15 | 15 | 20 |
| Birch (figured) | 15 | 15 | 20 |
| Birch (plain) | 15 | 15 | 20 |
| Cedar | 20 | 20 | 30 |
| Cherry | 20 | 20 | 30 |
| Chestnut | 15 | 15 | 20 |
| Cypress | 20 | 20 | 20 |
| Elm, soft | 15 | 15 | 20 |
| Elm, hard | 20 | 15 | 20 |
| Fir | 30 | 30 | 30 |
| Gum | 20 | 20 | 20 |
| Hemlock | 30 | 30 | 30 |
| Hickory | 15 | 15 | 20 |
| Mahogany (figured) | 15 | 15 | 30 |
| Mahogany (plain) | 20 | 20 | 30 |
| Maple (plain) | 15 | 15 | 20 |
| Maple (birds eye) | 10 | 10 | 15 |
| Oak, red | 15 | 15 | 20 |
| Oak, white | 15 | 15 | 20 |
| Pine, white | 30 | 30 | 30 |
| Pine, yellow | 30 | 30 | 30 |
| Poplar | 15 | 15 | 20 |
| Redwood | 20 | 20 | 20 |
| Spruce | 30 | 30 | 30 |
| Sycamore | 25 | 25 | 30 |
| Walnut | 10 | 10 | 20 |

*Fig. 4. Cutting angles for common species of wood.*

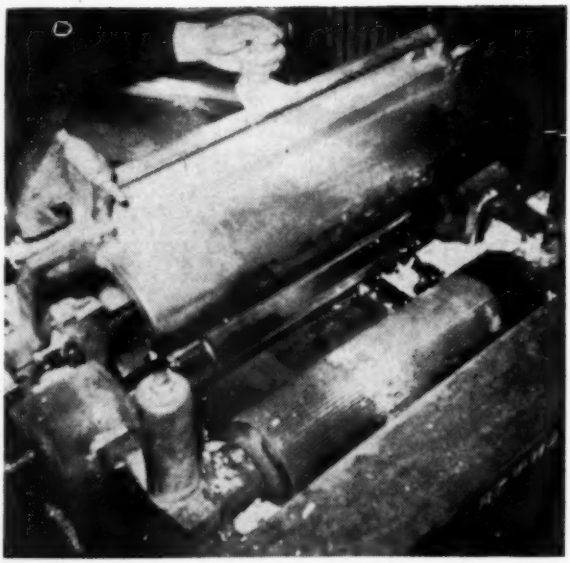


*Fig. 5. Chipbreaker lifted to show corrugated feed roll.*

backing on the side head and the surface was produced by a disc type cutterhead. The disc type cutterhead was a large diameter head approximately 14" in diameter having the knives fitted into the face or side of the disc. The idea of the disc type flooring head was to produce a smooth finish flooring that did not have rotation marks which could be found on many machines cutting with a cylindrical type cutterhead.

## SURFACERS

Unlike the matcher, the surfacer is primarily used for remachining of material that has already been machined to a specified dimension. Although there are many heavy planers that can be used for surfacing, there are very few surfacers that can be used for planers. The reason is the light structure of a surfacer compared to the heavy structure of a planer and that the surfacer is primarily designed to produce a surface parallel to a surface which is already on the stock.

Surfacers are made single or double, that is with one cutterhead to surface one side or top and bottom cutterheads to surface both sides. In most instances a surfacer has a cutterhead of a smaller diameter and it does not use as much power as does a planer. The feed roll is usually a corrugated roll and sometimes is made in sections. Sectional feed rolls are used when stock being planed is irregular or if narrow pieces are to be planed.

Having established the identity of the surfacer we can now point out the ultimate of fine surfacers known as cabinet surfacers. These machines are equipped with more feed rolls, finer adjustments and such number of knives as will produce a finish qualified for the finest cabinet work. In the use of a cabinet type surfacer there is no compromise with good and accurate machinery as the quality of the product depends entirely upon the accuracy of this machine. Oftentimes a cabinet ma-

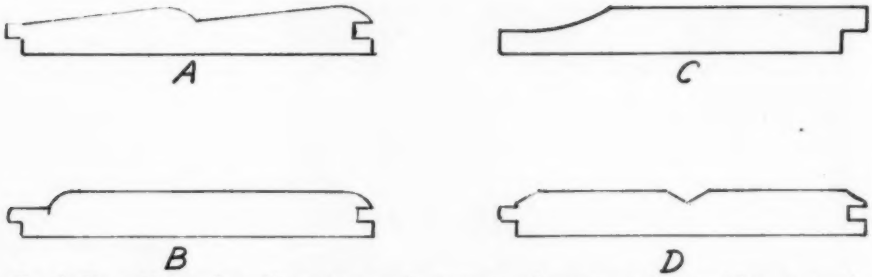


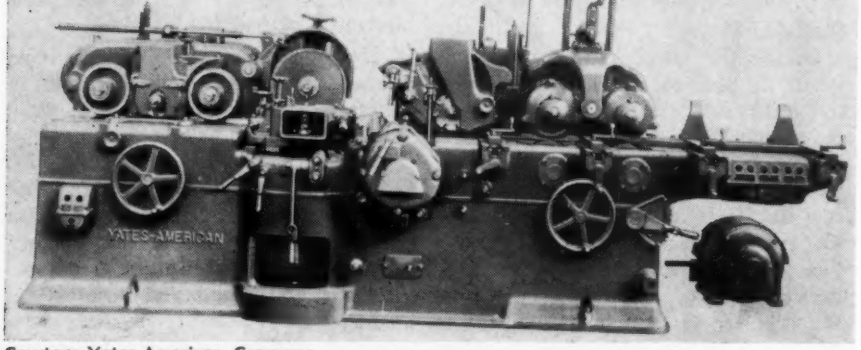

*Fig. 6. The addition of profile patterns make tongue and groove stock into siding or panel: A. Barn siding; B. Paneling WP6; C. Drop siding; D. Car siding.*

chine is graduated down to be used as an ordinary planer, but in most instances it is cared for and regarded for its ability to perform such fine work. Illustrated are the basic principles of the cabinet type surfacer.

## JOINTERS

In the area of hand jointers we find a considerable amount of difference between machines that are practically identical in their appearance and operation. When a jointer is disqualified for its work, it is not because of the basic design as there have been very few if any changes in hand jointers since their inception. The typical hand jointer shown is definitely an illustration of all hand jointers as their function is exactly the same. Figure 14 shows some of the many cuts that the cabinet maker makes on a hand jointer.

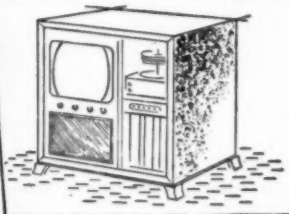
The standard hand jointer can be equipped with devices designed in such a way that the stock is carried over the table and cutterhead by power. This insures a definitely flat edge that can later on be used as a glue joint. The power fed edge jointer most commonly called a glue jointer can be equipped with cutterheads that create various




Courtesy Yates-American Company.
*Fig. 7. Modern all electric flooring matcher.*

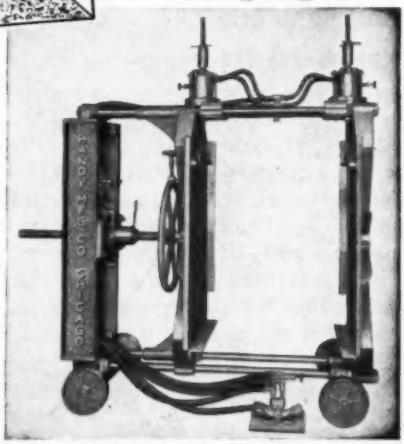
# Here's the way to assemble those cabinets right

**NEW handy DUAL-TRU CASE CLAMPS HAVE THAT MAGIC TOUCH EVEN WITH *MITRE JOINTS***



Take a good look at that portrait of Handy's new Dual-Tru. Picture your toughest cabinet job going into this clamp and coming out square and true—just right—in minimum assembly time. No matter what the cabinet design, this superb new equipment has just about everything. At the right is the No. 405 Series with exclusive Handy No. 396 hollow-bore top pressure units, equipped all around with special Handy stroke control. Here is the sure answer to clamping mitred cabinets, because in a few moments the clamp is set-up to squeeze both sides and top at just the right speed, just the right pressure and to the correct dimensions to assure perfect joints.

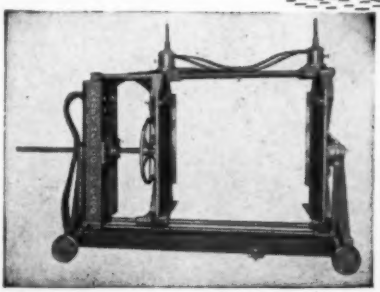
Because you get perfectly controlled and correctly applied pressure for large cases or small ones, the Handy Dual-Tru assures you a new high level of production at lower cost in your cabinet room. At last, there's a better, surer way; modernize now.



*Built for modern production. Patents Pending.*

## *You* GET DEPENDABILITY

The new Handy Case Clamp combines the best of advanced design with proved quality and ruggedness. Notice the main cylinder is hollow-bore, does not ride on the clamp-plate, permits hand operation should air fail. Look at those heavy, accurately machined castings. These clamps are Handy clamps, famous for decades as the best buy by far.



Here is the No. 400 Series Revolving Case Clamp with standard No. 397 hollow-bore top pressure units and counterweights. Any Handy Case Clamp may be equipped with one or more of these top pressure units, which are mounted up out of the way but reach down to apply top pressure even on a small cabinet. Revolving feature permits operators to work with ease on any part of the case.

*HANDY Manufacturing Company*

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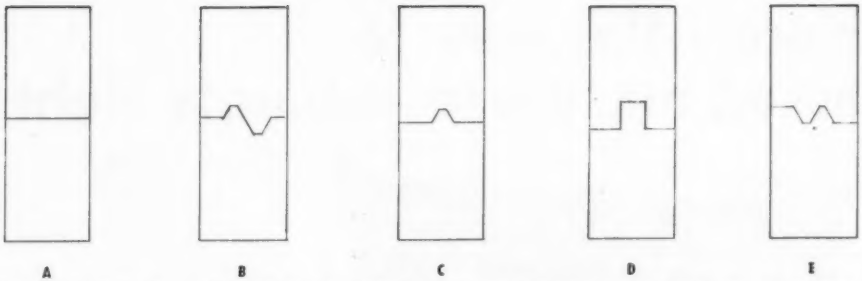


*Types of glue joints; A—Straight edge joint; B—reversible double tongue and groove; C—"V" tongue and groove; D—regular tongue and groove; E—reversible single tongue and groove.*

matching patterns for glue joints.

### VENEER JOINTERS

Although not alike in appearance and basic function, the veneer jointer still performs the same ultimate duty as other jointers. That is to create a joint by which veneers can be matched up for the lamination of high grade furniture and other veneered products. The veneer jointer is a machine which clamps together a large stack of veneer stock and while the pieces are firmly held, the cutterhead travels down the ways of the machine, cutting the pile of veneer stock to a very accurate edge. Later on, these pieces will match almost perfectly with each other piece.

### BOX BOARD MATCHERS

Another type of matcher is a machine which is primarily designed for the manufacture of thin box board shook, commonly seen on such items as apple boxes. The fruit and vegetable industry has, for many years, been trying

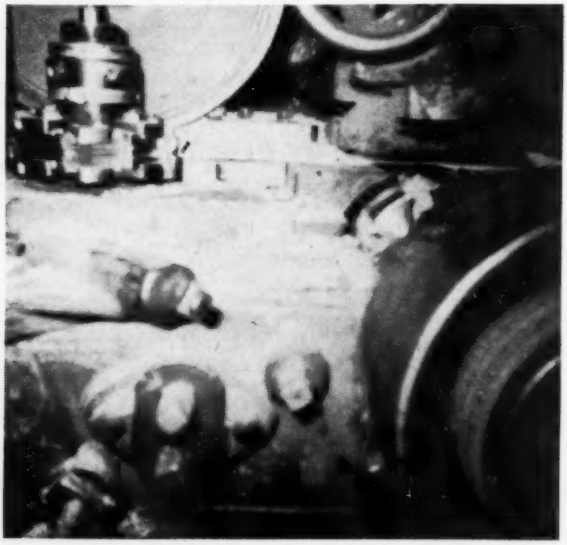

*Fig. 8. Left or outside head cuts tongue, inside head cuts groove.*

*Serving the Industry Since 1852*

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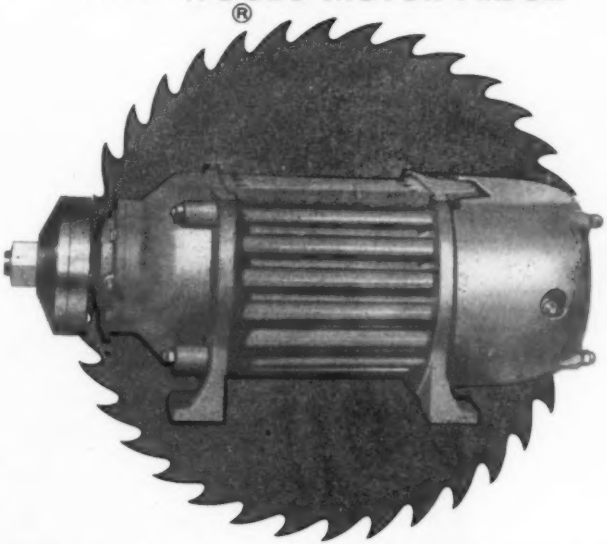

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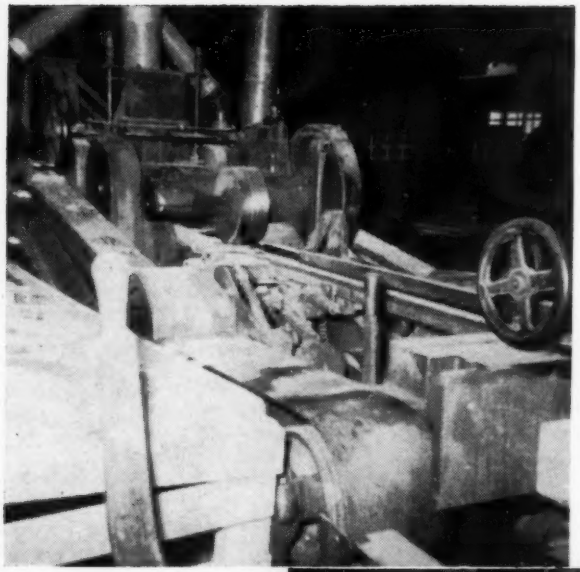


*Fig. 9. Stock entering into flooring matcher.*

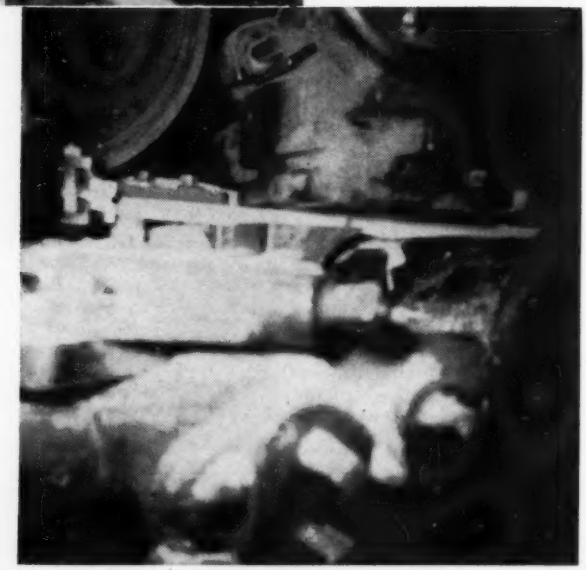
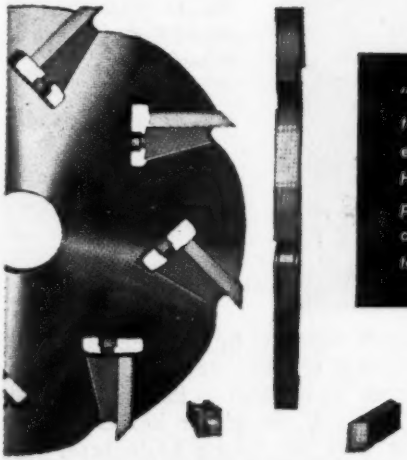


*Fig. 10. Bottom cylinder cutting face of flooring.*

to develop a substitute material for the typical wooden apple box but so far has been unsuccessful. In the manufacture of box shook it is necessary that the material be matched so that the sides of the box be firm. This is accomplished by machining a double tongue and groove in the edges of

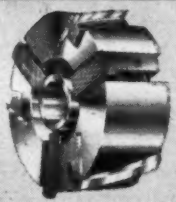
# "They've got to be good to stay here!"



*"With competition the way it is, we've just GOT to be hard-boiled when it comes to buying equipment. We use JONES & ORTH Cutter Heads because they give us MORE production per dollar, with LESS mechanical grief than anything we've found. They've GOT to be good to stay here!"*

**AT LEFT is shown a Jones & Orth 8-knife Wedge Type Groover Disc, fitted with corrugated adjustable high-speed steel teeth. Easily adjusted to, and always maintains exact desired width of kerf. Teeth are easily changed, sharpened or replaced. Available in 6" to 14" diameter, 4 to 12 knives.**

## What's Your Problem?



**Illustrated is a Jones & Orth Round Tenoner Head, designed for top production, ease and precision of adjustment, and minimum service requirements.**

**You're not gambling** when you specify JONES & ORTH Cutter Heads for your woodworking equipment! Over thirty years of specialized experience in this field assures you of top service and performance from *any* JONES & ORTH Head.

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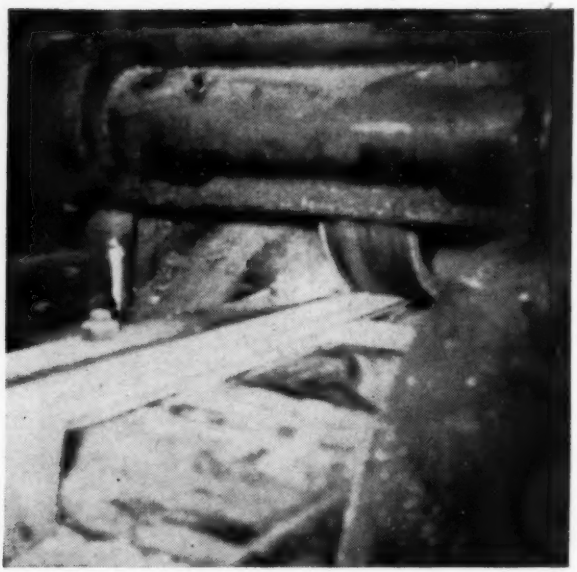


*Fig. 11. Completely machined flooring coming out of matcher.*

heavy stock and then resawing to a desired thickness, producing the fine appearing wide sides for boxes.

## CORE PLANER

To manufacture solid flush doors or table tops a core is prepared by edge gluing some of the lower grades of wood such as bass, poplar or gum and the board made up from this panel has to be planed to a desired thickness and then laminated with refined veneers. The core planer is similar to a cabinet surfacer except that it must be strong enough to plane the laminated stock as well as the glue that holds the stock together. In the manufacture of cores it is very necessary that the core stock be surfaced so that the glue will adhere. If the planer knives are dull or have the wrong knife bevel they will have a tendency to pound the surface and produce a glazed surface which will prohibit absorption of the glue. This, of course, would mean veneer failures and would be detrimental to the fine appearance required in veneered core stock.

## PLANING ON OTHER MACHINES

Many times a manufacturer has to produce only a small amount of ma-

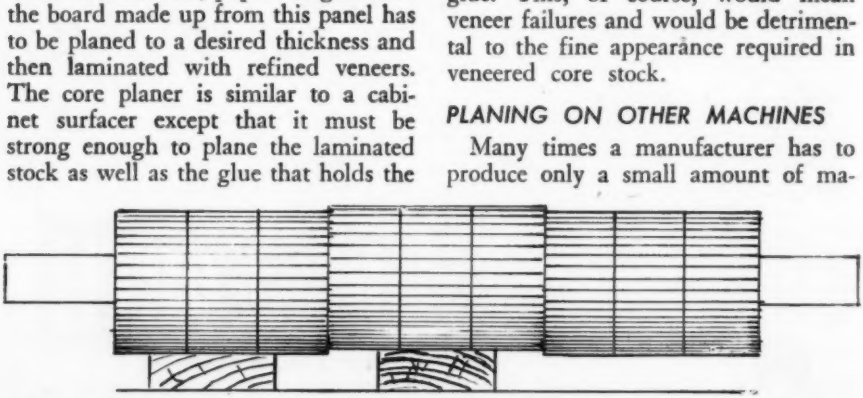


*Fig. 12. Section feed roll yields to difference of stock thickness.*

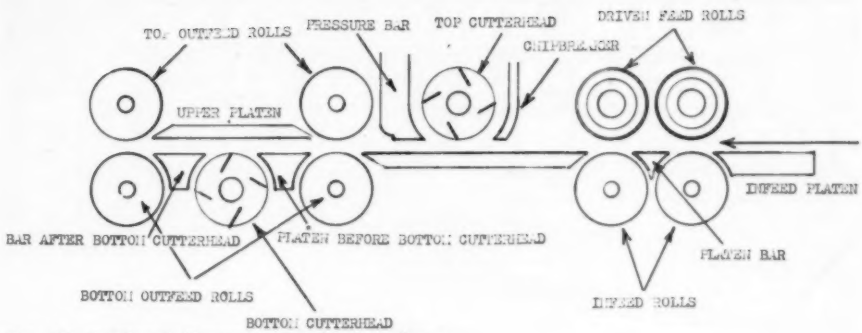



*Fig. 13. Sectional diagrams of cabinet surfacer.*

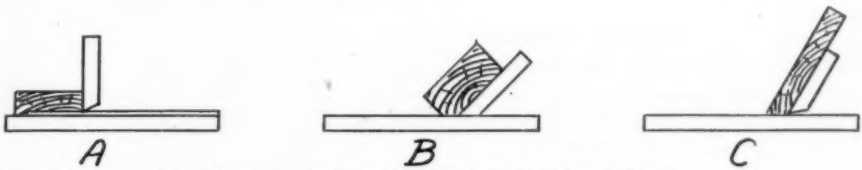



*Fig. 14. Some cuts made on hand jointer: A. Rabbet; B. Chamfer; C. Bevel.*

terial and finds that this planing operation can be successfully accomplished on a molder. A typical molder equipped with round top and bottom heads can be used as a planer for certain stock. Although the molder is more valuable in its original capacity—to make moldings—it still can be used to do surface planing. Many of the patterns that are molded are planed on at least one side and the surfacing head of the molder should have the same capacity to be able to plane the stock. Small rectangular strips or latticed molding can be made on a molder with the great advantage that the molder can produce lineal footage with such thin stock. The hopper feeding mechanism of a molder can also prove very valuable when the machine is used to plane narrow S4F stock.

To summarize the wood machining operation known as planing it must be taken into consideration that the governing factors such as cutting angle, rate of feed, rate of cutterhead speed, type of feed rolls, moisture condition of the material, species of the material and many other elements must all be considered when the finest wood surfacing is the desired result.

**Knife marks per inch are equal to the revolutions per minute of the cutterhead times the number of knives divided by the feed rate (in feet) per minute times 12.**

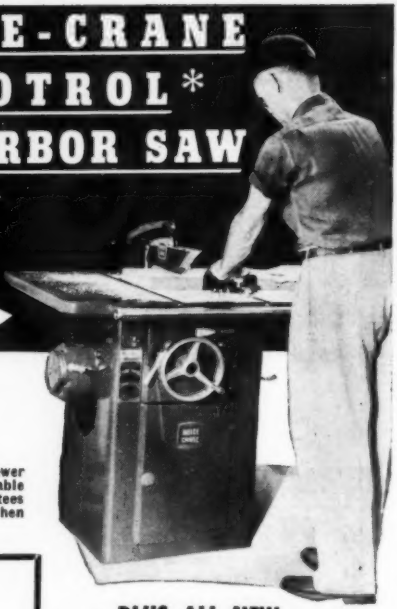
$$\text{Knife Marks} = \frac{\text{R.P.M. times No. knives}}{\text{F.P.M. times 12}}$$

**K.M.—Knife Marks per inch.**
**R.P.M.—Revolutions per minute.**
**F.P.M.—Feet per minute.**
(This chart has been worked out according to formula)

*Fig. 15. Knife marks formula.*

**One businessman to another: "We're a non-profit organization. We didn't mean to be, but we are."**

# THE NEW BOICE-CRANE MASTER-MONOTROL* 10-INCH TILTING ARBOR SAW



★ CUTS A BOARD PLUMB SQUARE!

★ RIPS SUPER STRAIGHT!

★ CUTS MITERS THAT REALLY FIT!

## ADDED POWER
## NOW—MOTORS TO 2 H.P.

The only full-powered 10-inch saw. Heretofore, enough power to cut full 3" hardwood in production was usually available only in 12-inch saws. Boice-Crane full powering guarantees freer sawing, reduced hazard of accidental kickbacks when freeing stock from a chocked blade.

### Specifications

Saw Blade Travel: 0 to 3¼"
Arbor Speed: 4000 rpm's
Capacity: Cuts off 15" wide, 1" thick
Cuts off 13⅞" wide, 3" thick
Rips to center of 6 ft. wide stock
Arbor: ¾" dia.
Table Size: 36" wide x 27½" long with extensions

## . . . PLUS ALL NEW "ANGLEMASTER" TRUNNION

All trunnion parts, support surfaces, bearings and contacts are oversize, extra rugged. Many parts actually equal in size to those on 12-inch saws.

## Direct Locked Under-Assembly for Higher Precision at the Cut

The entire train of parts from trunnion to arbor lock one upon the other to equal the rigidity and precision of one solid part. All looseness is locked out. Only Master Monotrol has it!

## Single Control for Positioning Blade

New Monotrol* positioning system reduces blade controls to a single large handwheel, plus a height lock and a tilt lock, all mounted on the front—equally convenient for right-handed or left-handed operators! No groping, no out-of-reach controls, fewer accidents, an amazing saving of time on variety work.

## Other New Features

5% to 29% faster blade speed. Cuts faster, cleaner, smoother. Up to 44% more ripping capacity without extra attachments.
Power-packed 3 V-belt drive. *Start-stop switch which accidental manipulation can turn only "OFF," never "ON." *Blade tilts left—the safest way for right-handed operators. *Steel, all-purpose insert serves saw blades, and dado heads as well, without constant interchange, and at no extra cost. *Ground cast-iron fence has all-new micro-control, easier foolproof adjustments.

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# 7

# RIGHT OR WRONG

**A roundup of day to day in-plant problems and how they were handled by management men. Each incident is taken from a true-life grievance which went to arbitration. Names of some principals involved have been changed for obvious reasons. Readers who want the source of any of these cases may write to WOOD WORKING DIGEST.**

*Must an employee be paid if he is called in on his day off to discuss with his boss mistakes he had made in his work?*

**What Happened**

Oscar Janidle was home looking at television. He suddenly got a call from his supervisor. The foreman was good and sore. It seems that Oscar had made a bad error in his work that day.

"You come in tomorrow. I want to talk to you about it," the supervisor boomed into the phone.

"But tomorrow's my day off," pleaded Oscar.

"You do as you're told or you'll have lots of days off," the supervisor answered, and hung up.

The next day Oscar came into the supervisor's office and got a good dressing down for his mistake. He was told that if he committed another such serious error he would be disciplined "but good." During the conversation the supervisor and the worker also went over the latter's work history. The whole business took about an hour.

The next week, Oscar put in a request for 4 hours "call in pay." The company had a policy that where an employee is asked to report for work he shall be guaranteed at least four hours' pay. The management turned down Oscar's demand. It said he was NOT called in to work. He was called in to be "bawled out." Oscar said that

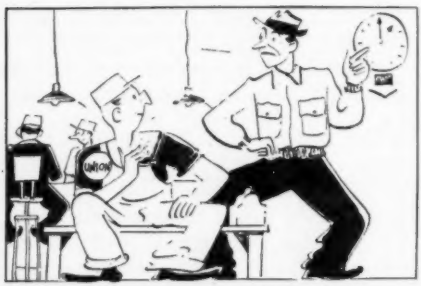
a man's day off is sacred, and if the company calls him in for any reason whatsoever, the man must be paid.

Was Oscar: Right ☐ Wrong ☐

**What Arbitrator Ralph T. Seward Ruled**

"An employee's job obviously includes more than the mere physical performance of certain objective tasks of operations: it includes his participation as required in the process of intercommunication between his superiors and himself. The giving and receiving of orders and instructions is only one phase of the supervisory process.

"Another and equally important phase is the sound administration of discipline. Thus the employee is 'working' when he is listening to words of warning or reprimand. He is being questioned, warned or reprimanded in his capacity as an employee about his performance as an employee. If he is required to participate in a conversation looking toward the improved performance of his assigned tasks then such participation is part of his job and he is entitled to be paid accordingly. When Janidle was called in to discuss his mistake he was to all intent and purposes working and is entitled to 'call in pay' of four hours."




*Can a shop steward eat lunch on company time and demand that he be paid?*

**What Happened**

The company had a paid lunch hour of half an hour. During that time the shop steward made his rounds for handling grievances of employees. It was his one chance, he claimed, to get employees in a group. After the lunch period, the steward would then eat his own lunch instead of going back to his regular job. The company's policy was not to pay stewards for time in handling grievances. In the past the company had permitted the union man to eat his lunch on company time but then changed its mind and began docking the steward for time he took to eat. He brought a grievance.

The company maintained that it had established no precedent. The union agreement specifically said that time spent by stewards to handle grievances would not be paid for and therefore it had a right to tighten up on its previous leniency. The management also maintained that the steward has access to employees at other times and is free to circulate among them during working hours provided the steward asked for permission and signed "in" and "out."

Was the company: Right ☐ Wrong ☐

**What Arbitrator Alex Elson Ruled**

"The company does provide a paid lunch period for employees as well as for the union representative. When the steward chooses not to avail himself of that paid lunch period he does so solely of his own choosing. It is for his own convenience that he uses the paid lunch period to handle grievances. He is therefore not entitled to take time later to eat his lunch at company time. Precedent has nothing to do with the issue because the contract specially says that grievance time

will not be paid for, and if the steward decides to take time out to eat after the designated lunch period, he must do so without compensation."

*Is "antagonizing a customer" just cause for discharging a salesman with a good ten year record?*

**What Happened**

Peter Reynolds was a good salesman. So good, in fact, that he was given an important account to service and did so without much supervision from the head office. One day when Reynolds came to visit the account he found that the company had a strike on its hands. There were pickets outside. Reynolds got into a conversation with the pickets and was overheard to say to them: "I think you fellows are in the right. If I were in your shoes, I'd be out on strike, too." The salesman then left, refusing to cross a picket line. He was a member of a union himself, and later said that it was against his union's policy for members to cross picket lines.

A few days later Reynolds returned to service the account and discovered that the strike was still on. He again engaged in conversation with the pickets. The strike was finally settled, but when Reynolds showed up, the account refused to do business with him. In fact, the customer sent a strong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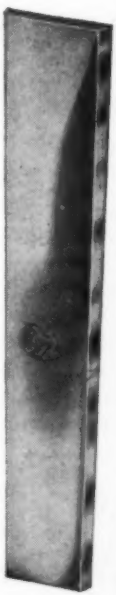

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note to Reynolds' boss stating that he had interfered with the strike, and that it didn't want him coming around. Further, they wanted him fired. The company discharged Reynolds for "antagonizing a customer." The case came to arbitration. Reynolds put in the following defense:

1. His discharge had nothing to do with his job as a salesman.

2. The strike is all over and the employees who engaged in it were all taken back. There is no reason for post mortems.

3. The customer had no reason to be so exercised. A man has a right not to cross a picket line as an "individual freedom."

4. No matter how important a customer may be, the company had no right to give in to the demand that he be fired.

The company's defense was simply that Reynolds showed such bad judgment in his behavior that they couldn't be sure he wouldn't antagonize another customer if such a situation came up again. Then again, management maintained, he overstepped his bounds. To cap it all, the company held that it is better to sacrifice a salesman than a top customer.

Was the company: Right ☐ Wrong ☐

**What Arbitrator Thomas A. Knowlton Ruled**

"Reynolds' refusal to cross a picket line may be considered an individual right in this situation, implying a minimum of interference. It is an impersonal act of restraint which both labor and management normally expect in this area and does not connote individualized hostility. But the customer found fault with Reynolds because in its judgment he extended this form of institutional impersonal advocacy and sharpened it by public expression of sentiment. And he did that as an employee of the company he worked for. Mr. Reynolds therefore alienated the customer to the point where he was refused permission to come back as a representative of his company. He thus jeopardized the relations between his company and the customer. I therefore find the discharge proper."

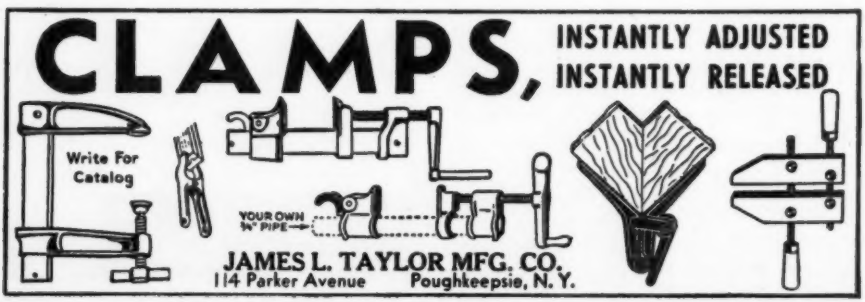
---

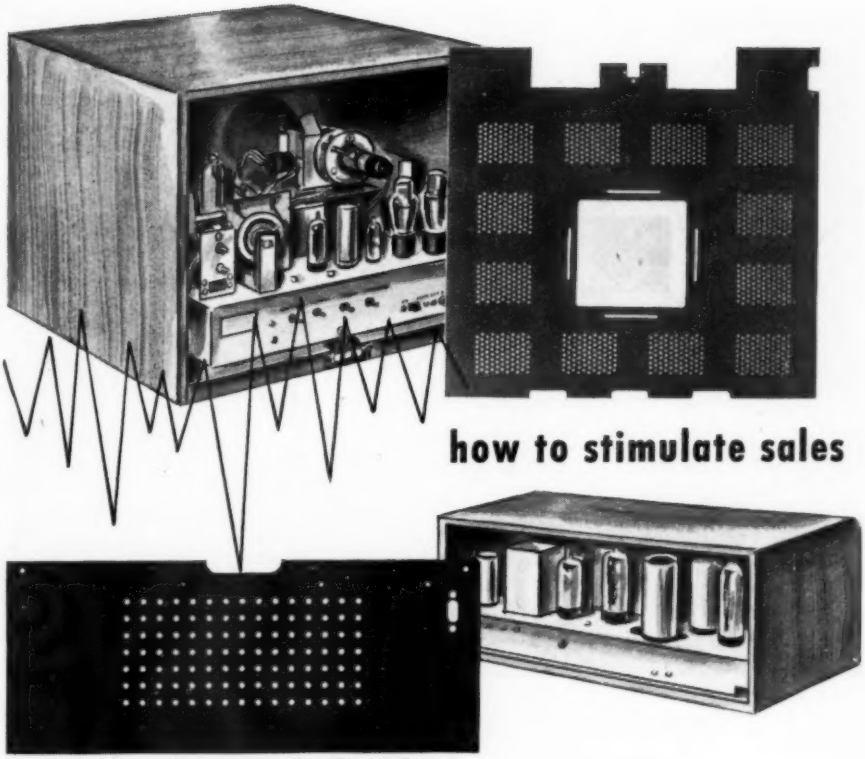
Complained a new draftee: "I can't say much for Santa Claus. Fifteen years ago I asked for a soldier suit and now I get it!"

---

Head cook: "Didn't I tell you to notice when the soup boiled over?"

Assistant: "I did. It was half-past ten."





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EVER SEEN an 1/8" Hardboard that could be bent to a 1" radius without rupture? That could be permanently bent into single or parallel axes curves as well as simple compound curves and shallow draws? Standard Weytex*, by Weyerhaeuser, will do all this . . . and more!

That's because it's an improved Hardboard made by improved dry-process methods. Fibers are accurately classified for size and length, carefully combed, and then felted with dry air. Because fibers are interlaced in all directions, instead of running in the same direction, panels are exceptionally uniform in density, have high tensile and internal bond strength.

Board is strong and durable, yet not brittle; can be worked in short radius bends by moisture, pressure and heat; has uniformly hard, smooth surfaces that lend themselves to a wide range of finishes.

Find out how these improved Hardboards can help you to boost quality . . . lower costs!

*TM Reg.

Standard Weytex is smooth on one side and has a screen impression on the other. Panels are light tan in color with a pleasing fiber pattern.

- Takes all types of finishes including wiping stains, lacquers, air-dried and baked-on enamels. An ideal base for plastics, fabrics, veneers.
- Excellent gluing, laminating characteristics. No delamination nor peeling.
- Splinterproof, sliverproof. No grain to raise, check or craze.
- Ideal for: furniture parts, automotive foundation parts and panels, sliding panels, cross banding, core material, mirror backs, cabinets, toys and games, TV backs, displays, signs, containers and many other uses.
- Available in following thicknesses: 1/12", 1/10", 1/8", 3/16", 1/4".

## Weyerhaeuser Sales Company

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# ELECTRONIC GLUING Produces Table Tops

By
Robert D. Eckhouse

ELECTRONIC gluing is a subject of never-ending interest to many manufacturers in the woodworking industry. This month we turn to the Bally Block Company, Bally, Pennsylvania, to see how this firm uses high frequency bonding equipment to produce laminated table tops.

The equipment used is Radio Receptor Company's Thermatron electronic edge bonding machine. This picture story includes a picture of the old fashioned method which is still used for short sample runs. Contrast in time between the old method and the new method with electronic equipment is three hours as against three minutes. It is interesting to know that the space needed for seven short panels with the old method is just about the same space as that taken up by the new electronic press which gives many times more production.

The subject of high frequency bonding or electronic gluing may seem complicated to plant personnel. However, manufacturers of the equipment will be glad to work with any plant desiring to investigate this method. Radio Receptor, 251 W. 19th St., New York City, maintains a laboratory and application engineering staff for investigating any special problems or applications requiring special consideration.

The Thermatron edge bonding machine at Bally Block is normally operated by two men who perform the glue spreading, lay-up and off-bear operations in addition to controlling the infeed mechanism which starts each radio-frequency and press operating cycle. The company uses 2″ hard maple to produce panels 120″ long by 10″ wide. Stock is taken from the glue spreader and laid up on the infeed table in front of the press. A 20 kw Thermatron generator is used.

The press size is 42″x100″ with a daylight opening of 6½″. Stock 8′ long can be glued in the press. In order to make a panel 120″ long, it is necessary to glue the work progressively. A section 96″ long is glued and the next load pushes the bonded section out and the press comes into action and completes gluing the part of the panel that had not been bonded. Time required to edge bond an entire panel is just three minutes. The press exerts a pressure of 600 lbs. p.s.i.

With electronic gluing, the Bally Block Company gets more payload per factory foot than ever before. It is

# "Novoply helps us sell a better wardrobe at a lower price,"

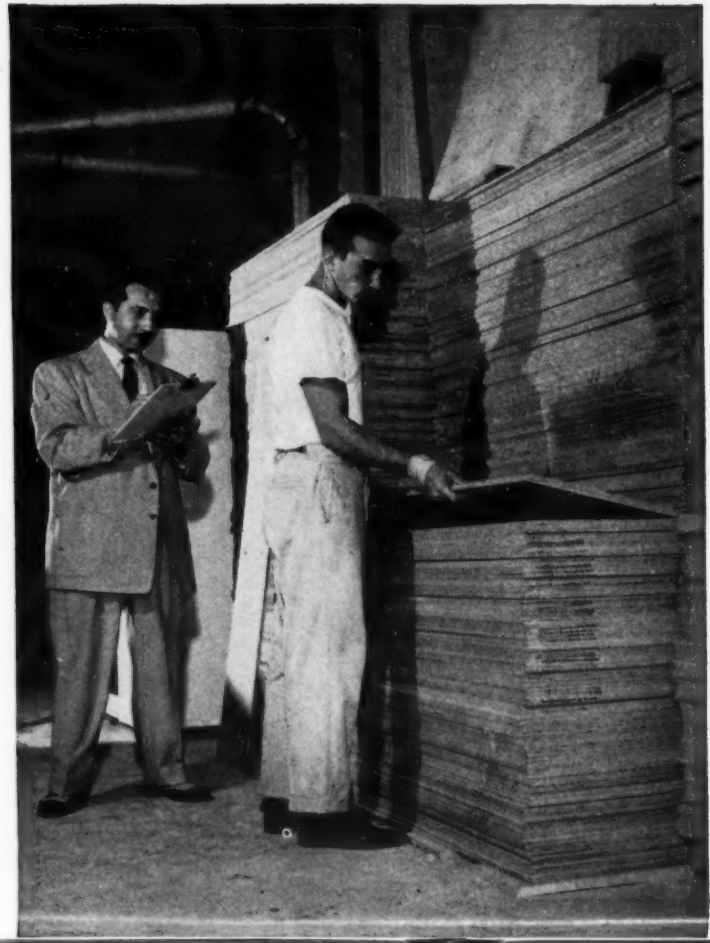
**says Joseph Favorito, Ro-Kay Woodworking Co., Brooklyn, New York**

Every wardrobe made by Ro-Kay features sliding door panels of Novoply. Here's why one of the biggest manufacturers of unfinished furniture depends on Novoply:

**Novoply helps keep quality high, price low.** Its resistance to warping far surpasses every other material Ro-Kay tested. To this freedom from warping—so vital in sliding doors—Novoply adds the advantages of panels that are good both sides, free from patches, plugs, and grain raise. And, because Novoply is the product of a rigidly controlled manufacturing process, its price is stable, enabling accurate cost control.

**How Novoply can help you sell.** Novoply's textured look lends a "fine furniture" air that wins customers. Home craftsmen find it easy to finish Novoply with clear lacquers, varnishes and waxes, making useful and attractive pieces of furniture.

**Find out how** Novoply can help you make top-quality products that sell. Send the coupon today!

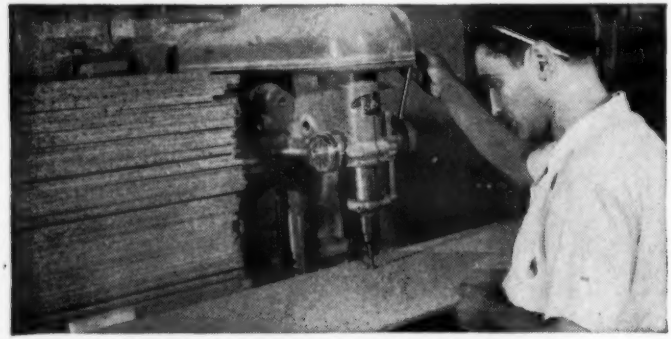


Joseph Favorito, at left, of Ro-Kay Woodworking Co., inspects firm's large stocks of Novoply in several standard sizes; they also have some sizes delivered cut to order.

and attractive pieces of furniture.

**Find out how** Novoply can help you make top-quality products that sell. Send the coupon today!

Joseph Favorito, at left, of Ro-Kay Woodworking Co., inspects firm's large stocks of Novoply in several standard sizes; they also have some sizes delivered cut to order.



**There's no costly waste with Novoply.** It drills neatly and cleanly, glues perfectly. Ro-Kay worker here drills holes for door pulls . . . operation takes a second. Novoply does not chip or split.

**Novoply sliding doors add** unusual good looks to help keep Ro-Kay wardrobe sales high. The firm ships 80 to 100 wardrobes daily, and is planning new expansion to meet constantly growing demand.

**NOVOPLY PANEL SPECIFICATIONS: Thickness:** ¾"; **Sizes:** 24" x 72", 24" x 96", 30" x 48", 30" x 60", 30" x 72", 36" x 72", 48" x 48", 48" x 72", 48" x 84", 48" x 96"; also cut-to-size for volume users from panels 6' x 12' and 4' x 16'. Available in ⅜", ⅝", 1 1/16", 1" thicknesses, sizes 48" x 96", and other sizes. **Important Note:** Only slight extra cost for long-length Novoply panels up to 16'.

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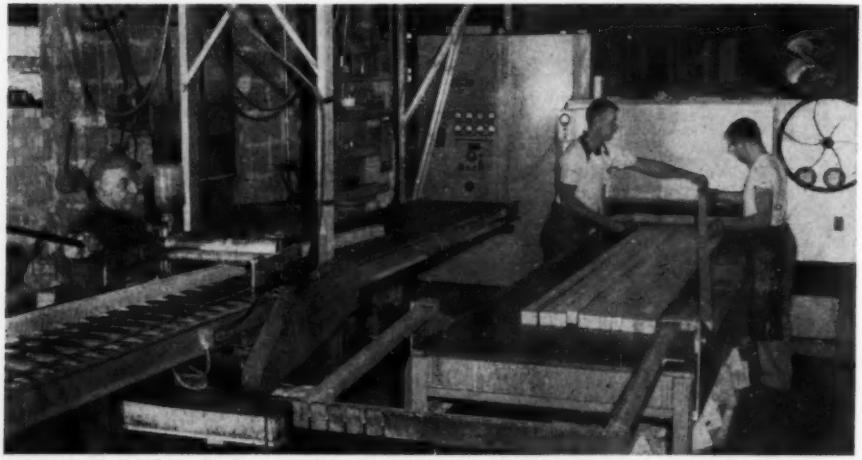
*Here is the way edge bonding used to be done —even when the orders ran into thousands of pieces. This was a slow hand clamping operation and the blocks need to be held in position for three hours until the glue sets.*

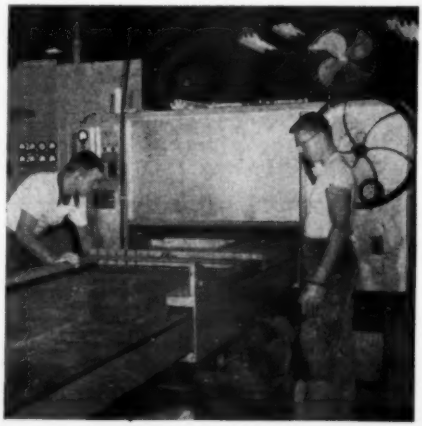
no longer necessary to have a large area for storage space while the glue dries. Before utilizing electronic gluing, the edge bonding department was a real bottle-neck. In fact, a great deal depended upon the temperature within the plant. Now, cool weather or humid, the edge bonding operation is done on a steady, fast schedule and rejects are practically non-existent.

Here are some of the outstanding features of Thermatron equipment. Automatic control of electronic and mechanical functions play an important part in obtaining maximum production. The automatic power control automatically sets the generator for the maximum output level possible for each load, regardless of the change in dielectric properties of wood and glue during the curing cycle. Side pressure in the press is provided by a bank



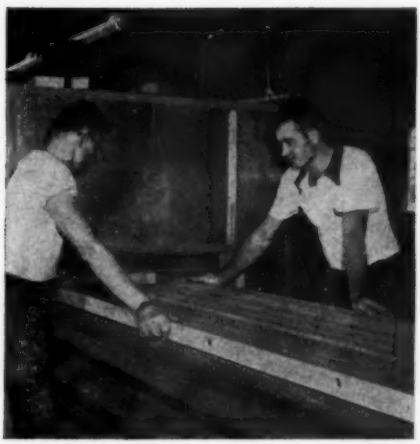
*Edge bonding 2" hard maple at the Bally Block Co. The Thermatron electronic generator and hydraulic edge bonding press produce panels 120" long by 10" wide.*

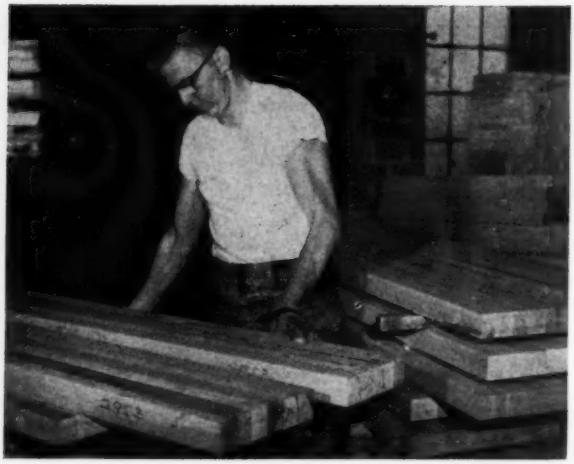
*Here the stock is being laid up on the infeed table which is power operated. When the table is full it will be pushed into the press. Notice the sections of other panels now in the press which have been glued by radio frequency.*



*The feeding device has pushed the panels practically their entire length through the press. The next step will be to press the button to start the drying cycle.*

*The electronically bonded panel ready to lift out of the press. Time cycle through the press is three minutes.*





*At the left are edge bonded panels as they were removed from the press. The bond is actually stronger than the wood itself after the handful of seconds the panels receive their electronic "jolt." Table tops to the right have been through the planer and are ready for shipping.*

of hydraulic cylinders, each on 3″ centers and individually actuating a 3″ wide shoe making contact with the work. Thus, for every 12″ length of press there are four 3″ wide shoes, each exerting uniform side pressure. In addition, the height of the whole bank of cylinders can be easily raised or lowered for adjustment to the exact center of each load that may vary in height up to 6″.

Bally Block is only one of many companies that have found in electronic gluing an answer to some of their problems.


**WOOD WORKING DIGEST**

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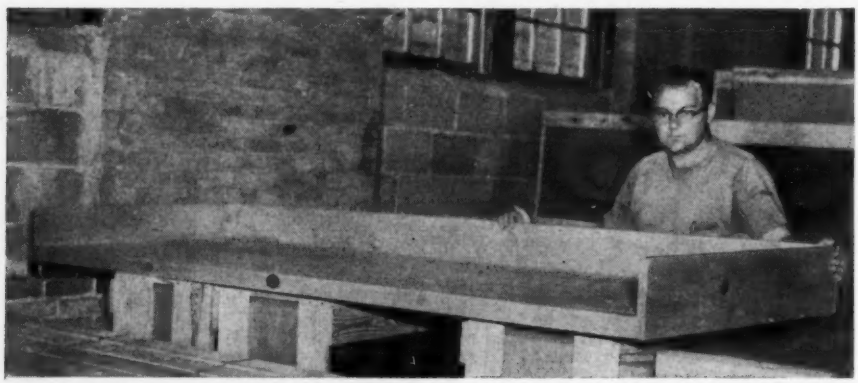
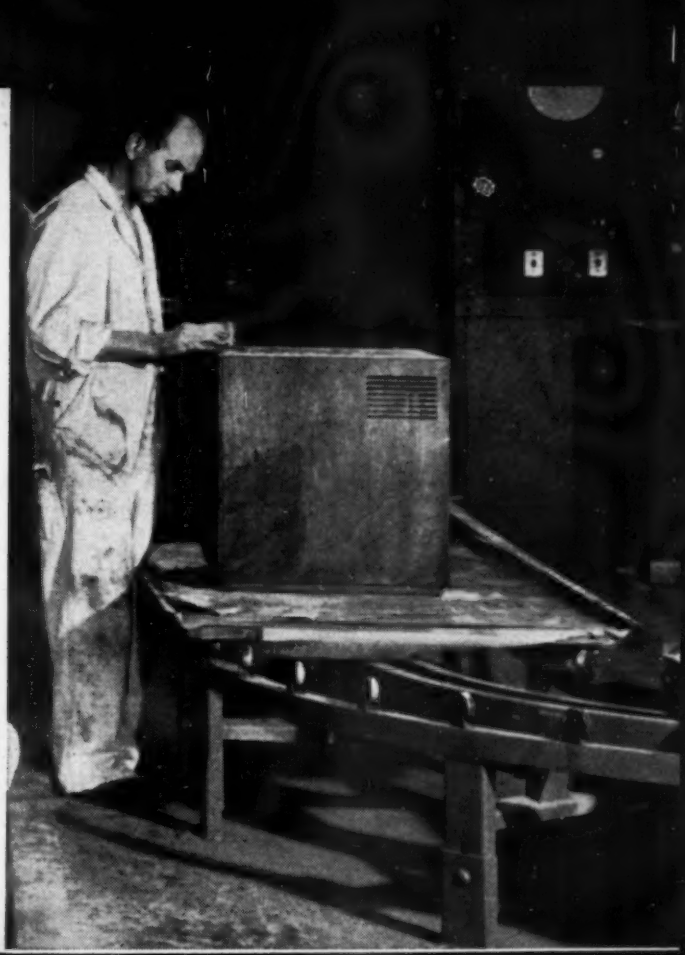


*Bally Block Company's shipping clerk is ready to crate the finished job. This unit will probably become a laboratory work bench.*



# FINISHING SECTION

**Furniture Finishing**

**What's New**
**In Sanding?**

**Leading furniture-maker proves it...**

# 3M PRODUCTION PAPER BELTS LAST 50% LONGER

PRODUCT OF 3M RESEARCH

**1** Standard Furniture Co., makers of quality furniture, were using garnet paper belts on stroke sanders for sanding veneer and hardwood desk tops and panels. Production was slow—averaging 15 to 20 desk tops per belt—and costs per finished piece were high.

**2** A 3M Representative suggested that this Herkimer, New York, manufacturer switch to 3M Production Paper Belts for this stroke sanding operation. Production jumped to an average of 25 to 30 desk tops per belt—at a considerable over-all cost saving.

**3** Extra-sharp, extra long-lasting 3M Production Paper Belts are made expressly for stroke sanding operations. They cut clean with less pressure, give better finishes faster than any other abrasive belt you can buy. For full details about 3M Production Paper Belts and the complete line of 3M Coated Abrasives, write Minnesota Mining and Mfg. Co., Dept. HD-125, St. Paul 6, Minn. for FREE booklet, "3M System for Sanding and Finishing Wood". Ask about the new 3M Woodworking Movie, "It Goes With the Grain".

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3M COMPANY

# FURNITURE FINISHING

## Part 8

By

HAROLD B. GATSLICK

BEFORE developing a discussion of varnish coatings, it would be well to differentiate between lacquers and varnishes as usually understood in the trade.

Lacquer coatings, in general, involve those materials that form a surface film by volatilization of solvents and thinners, whereas varnish coatings involve evaporation of solvents and polymerization reactions.

Varnishes may be divided into three primary types. These are oleoresinous or oil varnishes, synthetic varnishes and spirit varnishes.

Spirit varnishes are solutions of gum or resin in a volatile liquid, with or without the addition of modifying agents. Spirit varnishes are in reality lacquer-type coatings since they do not require oxidation or polymerization, but harden by the evaporation of their volatile solvents.

Clear oil varnishes contain drying oil, resin, driers, solvents and thinners. The drying oils may be of animal or vegetable origin and consist of mixtures of mixed triglyceryl esters of fatty acids. The drying of an oil is primarily a curing process involving hardening.

Those oils with the greatest reactive power, although they are the fastest drying and give the densest molecular structure, discolor during drying to a greater extent than the less highly conjugated oils. Therefore, in clear varnishes drying speed often must be sacrificed to reduce yellowing tendencies.

Corn, soybean, linseed, dehydrated castor, perilla, tung and oiticica are commonly used semi-drying and drying oils, with corn being the least reactive and oiticica the most reactive and fastest.

Oils dry by non-oxidative or thermal hardening and oxidative hardening. Thermal polymerization is predominant in the more highly conjugated oils and is affected by high temperatures, heat bodying or baking, without the presence of oxidation catalysts. Oxidative drying is affected by low temperatures in the presence of strong oxidation catalysts. It is reported that non-oxidative polymerization produces films of greater durability and chemical resistance than oxidative polymerization since oxidation products are more reactive and may form soaps and decompose. Natural or synthetic resins are added to give desired film properties because drying oils in themselves lack hardness and gloss and are very slow drying.

Courtesy E. I. du Pont de Nemours & Co., Inc.
***Spray application of synthetic varnish topcoat in a large furniture plant.***

The number of gallons of drying oil per 100 pounds of resin is termed the oil length of a varnish. Long-oil varnishes contain from 40 to 100 gallons of drying oil per 100 pounds of resin, are slow drying, tough, durable and suitable for outdoor applications. Medium-oil varnishes contain from 12 to 30 gallons of oil per 100 pounds of resin and are the so-called interior or architectural varnishes, such as cabinet and floor varnishes, which are intermediate in toughness and durability. The short-oil varnishes contain from 4 to 6 gallons of oil per 100 pounds of resin and are harder, more brittle, give increased luster and are fast drying. They find wide usage as furniture, rubbing and polishing varnishes.

## *NATURAL RESINS*

Resins may be separated into two primary classifications, natural and synthetic resins. Most of the natural resins are from wood origin, and are obtained by systematic tapping of living trees or from fossilized tree gums. The fossilized forms produce harder varnishes.

**Dammar** resins are very light in color, soluble in petroleum and coal tar naphthas, are compatible with oils and ethyl cellulose and also are compatible with nitrocellulose when the resin is de-waxed. Dammar resins are marketed as Batavia and Singapore dammars.

Pale East India, black East India and batu are East India resins similar in composition to a fossilized form of dammar.

**Copals.**—The Congo copals are reported to be the hardest and oldest of the natural resins used in the manufacture of coatings. Heat processing is required to make this resin compatible with oils and organic solvents. Congo copal is abundant and relatively inexpensive. It is widely used in short-oil length varnishes for the furniture industry.

The Kauri copals from Australia and New Zealand range next to the Congo copals in hardness. Kauri copal is an excellent resin for high-quality furniture applications but its high cost limits its use.

Manila copals are of recent origin except for the fossil boea obtained from South Pacific islands. Manila copals are used in shellac substitutes and to some extent in floor and furniture polishes.

**Sandarac** is a high-cost resin from North Africa and finds limited use in wood coatings.

Other natural resins include accroides from Australia, elemi from the Philippines and mastic.

**Rosin.**—Gum and wood rosins are economical, abundant and find wide

usage in the protective coatings field. Gum rosin is obtained by systematic tapping of slash pine and long-leaf pine, and the wood rosin by solvent extraction of stumps of these same species.

Unmodified rosins are characterized by high acidity and unsaturation, color instability, crystallizing tendencies, poor water and chemical resistance, and a wide range of solubility incompatibility. Rosins are modified by chemical and heat treatment, hydrogenation or salt formation to remove undesirable constituents. Modification of rosin resins offers a wide variety of materials with excellent film-forming characteristics and good compatibility with other film-forming materials and a wide range of solubility.

## *SYNTHETIC RESINS*

**Alkyd resins**—Unmodified and modified alkyd resins are becoming increasingly important and today account for a greater volume than any other resin or resin group used in wood finishes. Alkyd resins are modified by the addition of phenolic, urea, and melamine resins. Alkyd resins yield varnishes with good toughness, durability, adhesion, paleness and pigment-binding properties. They have a wide solubility range and are compatible with a wide variety of other resins.

**Phenol-aldehyde resins**—The phenol-aldehyde class of resins has developed into a wide and diversified group of products and additives finding wide and voluminous usage in surface coatings and other products.

A large variety of resins with a wide range of characteristics may be secured depending upon the degree of substitution of the phenol, the aldehyde, the

*Close-up of spraying operation.*

aldehyde-phenol ratio, the use of co-reacting or dispersing materials such as resins, alcohols, etc., the nature of the catalyst, and the temperature and time of reaction.

Phenolics may be divided into four primary types: spirit soluble thermosetting, oil soluble modified thermosetting, oil soluble thermosetting and oil soluble thermoplastic.

Phenolics generally are dark in color or darken on aging although research has produced and promises paler phenolics. The cured thermosetting types are insoluble in all common solvents and only a few are slightly attacked by alkalies or weak acids. However, they may be decomposed by strong alkalies and by oxidizing inorganic acids. Modified or reduced thermosetting types normally have a solubility approaching that of the modifying resin. The thermoplastic oil soluble resins are soluble in xylene, dispentene, butanol, butyl lactate and, to a limited extent, in naphtha and mineral spirits.

A typical clear phenolic resin topcoat formulation is shown in Table 1.

**Table 1.—A TYPICAL CLEAR PHENOLIC RESIN TOPCOAT FORMULATION[1]**

**XV-17911, Clear Phenolic Resin Topcoat**

| | Weight in pounds | Gallons |
|---|---|---|
| XV-17911 Resin Solution (50 per cent solids) | 462.0 | 53.8 |
| Methanol Denatured Ethanol | 139.0 | 20.5 |
| Isopropanol | 139.0 | 21.2 |
| n-Butanol | 30.8 | 4.5 |
| | 770.8 | 100.0 |

Non-volatile: 30 per cent
Weight per gallon: 7.71 pounds

**Thinners:** In addition to the solvents shown above, most of the lower alcohols, esters, or ketones may be used. Hydrocarbon solvents should not be used.

**Accelerator:** Before being sprayed, it is necessary to add an accelerator to the XV-17911 solution in order to get proper heat conversion. On a one-gallon XV-17911 solution basis, this addition should be made as follows:

| | |
|---|---|
| 10 per cent $H_2SO_4$ solution | 0.1155 pounds |
| XV-17911 (50 per cent solids) | 7.71 pounds |

[1]By permission from **Bakelite Coating Products.** 1948. Bakelite Corp.

This Bakelite formulation calls for 25 minutes of air drying followed by a one-hour bake at 140° F.

**Amine-aldehyde resins**—This class of resins includes condensation products of urea, thiourea, guanidine, dicyandiamide, analine, substituted analines, sulfonamides, melamine and protein-aldehyde resins. Most of these resins are colorless, thermosetting condensation polymers. Of this group, urea-aldehyde condensation polymers are most important commercially. Increased use of synthetic finishes has spurred widespread research and development in this group of resins.

Oil soluble urea resins in conjunction with alkyds as low-bake type finishes are characterized by good adhesion, color retention, mar-proofness and resistance to oil, grease, weak acids and alkalies, and alcohol and ether-type solvents.

**Vinyl resins**—This group of resins would include resins such as polyethylene, polyisobutene, polybutadiene, polyisoprene, polydimethyl butadiene, polyvinyl chloride, polyvinylidene chloride, polychloroprene, polystyrene, polyvinyl alcohol, vinyl acetate polymers, vinyl acetal polymers, acrylic and methacrylic acid polymers and their esters and copolymers.

The synthetic resins of the vinyl group may be considered derivatives of polyethylene and are colorless, thermoplastic resins, many of which show rubber-like characteristics when used alone or with plasticizers or copolymerizing resins. Their use as additives in furniture finishes is somewhat restricted, but the wide range of physical properties make this group of interest for synthetic varnishes. Although research and development have made the resins of this group applicable for many processes and uses, the potential for surface finishes has not been thoroughly investigated.

**Other resins**—In addition to the resin groups mentioned, natural rubbers and rubber derivatives, hydrocarbon resins and inorganic resins which include the silicones, offer a large number of resins which are used to a limited extent but have an unlimited potential.

### *DRIERS*

Polyvalent metals such as cobalt, manganese and lead in the form of soaps, napthenates and resinates are used to catalyze varnish drying. They must be used in oil-soluble forms to be effective. Combinations of cobalt, manganese and lead driers are more effective than the use of any one alone. Small amounts of peroxide present in solvents, such as turpentine or dipentene, increase the drying action of the driers.

### *VARNISH SOLVENTS*

Solvents are added to varnishes to control viscosity, control flow characteristics and prevent skinning. The most powerful solvents are turpentine, dipentene and other commercially available terpenes and coal tar solvents, toluene, xylene and high-flash naphtha. Other solvents widely used but less powerful include mineral spirits, varnish makers' and painters' naphtha and modified solvents of petroleum origin such as hydrogenated naphthas.

### *MINOR CONSTITUENTS*

In addition to the oils, resins, driers and solvents, there are several other ingredients that may be added to impart specific properties to a given varnish. These would include anti-skinning agents, flatting agents, plasticizers, waxes, mineral oils and greases.

**Anti-skinning agents**—There are two general types of anti-skinning agents. The antioxidant type includes the polyhydroxy phenols and their derivatives. The solvent type anti-skinning agents would include solvents which will prevent skinning by acting as a dispersant and by having the ability to absorb oxygen without altering their volatility.

**Flatting agents**—A dull or flatting effect is obtained by dispersing microscopic particles throughout a film to diffuse the reflected light. Waxes, gums, diatomaceous earth, magnesium carbonate, and zinc and aluminum stearates are some of the more common flatting agents.

**Plasticizers**—Plasticizers impart such qualities as elasticity, flow, gloss, clarity and adhesion. Numerous plasticizers are available and will be discussed in the lacquer section of this series.

**Waxes, mineral oils and greases**—The amorphous waxes improve penetration and flexibility whereas crystalline waxes reduce penetration and hardness. Mineral oils and greases offer increased water resistance, antioxidant properties, flexibility and heat resistance.

With the large number of resins and other basic ingredients, an infinite number of varnish formulations are possible. New synthetic resins are becoming commercially available almost daily and varnishes can be custom formulated for any specific finishing job. Consideration of varnish formulations for furniture finishing is an extensive subject on which considerable work has been done and is in process.

It would seem in order to mention briefly the functions of the basic ingredients of varnishes. The oils affect waterproofness and impart flexibility, toughness, adhesion and durability. The

resins impart adhesion, gloss, hardness, toughness, ductility and resistance to reagents. The driers primarily accelerate drying time. The solvents or thinners are added to reduce viscosity or increase fluidity to allow easy application. In addition, they should insure homogeneity, control the evaporation rate and be non-hygroscopic.

### *VARNISH TESTING*

The American Society for Testing Materials has adopted standards for varnish testing. A detailed discussion of the tests is included in "Physical and Chemical Examination of Paints, Varnishes, Lacquers and Colors," Institute of Paint and Varnish Research, Washington, D.C., 9th edition, 1939.

Varnish tests include the following:

1. Appearance — examination by transmitted light for clarity and transparency.

2. Color—varnish color must be stated in terms of a reference standard.

3. Viscosity—viscosity is determined by comparison at 25°C. with secondary standards and expressed in poises.

4. Gloss—gloss may be defined as the ability of a surface to uniformly reflect light. This ability has been divided into five distinct types which are evaluated along different lines and with different instruments.

a. Objective gloss is independent of the lightness of the surface being measured. The Hunter Glossmeter and the Pfund Glossimeter are two of the basic instruments used in measuring objective gloss.

b. Subjective gloss is the contrast between specular reflection and diffuse reflection from the same surface. Subjective gloss is measured by instruments such as the Ingersoll Glarimeter, the Keiser Gloss Meter, Jones Gloss Meter and the Pfund Glossimeter.

c. Image sharpness is another type of gloss measurement whereby the clarity and distinctness of a reflected image is graded. Glossmeter for image sharpness determinations have been designed by Wolff, Pfund, Ewald, Sward, Levy, Hunter and others.

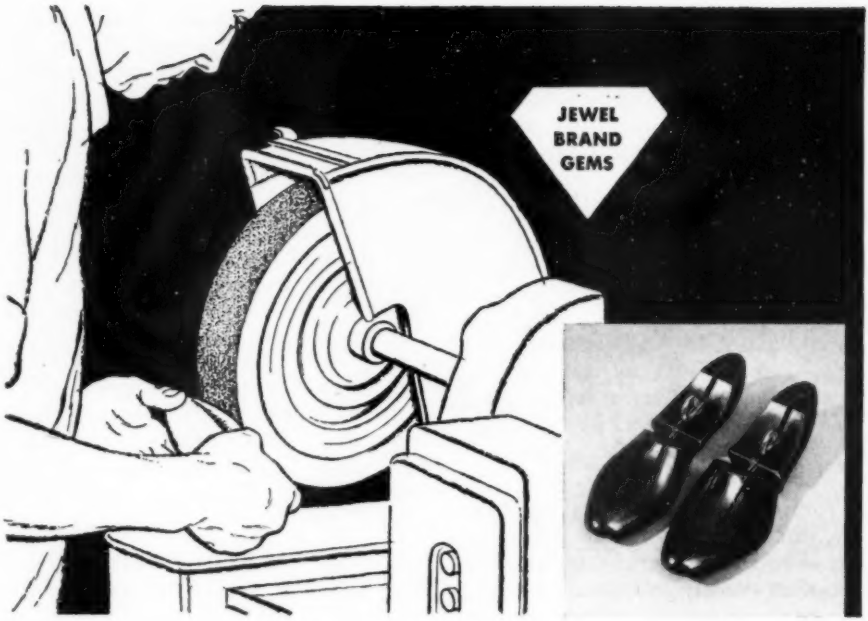
d. Bloom is a factor related both to the sharpness of images and subjective gloss. It may be defined as a halo reflection which can be evaluated and recorded photographically with sharpness of image instruments.

e. Smoothness is in itself not effectively gloss. Since the texture of a coating and the presence of particles, scratches and other irregularities have such a pronounced effect on gloss, smoothness has been included consequently in gloss evaluation. To date, no effective quantitative technique for measuring smoothness has been developed.

5. The specific gravity of varnishes is expressed at the ratio of a weight of a given volume at 25°C. to that of an equal volume of water at the same temperature. It is normally determined with a Westfall balance, a standardized hydrometer or a pyknometer.

6. All volatile flammable liquids flashing below 175°F., with the exception of fuel oils, are tested with the Tag Closed Tester. Fuel oil flash point can be tested by the Tag Tester but the Pensky-Martens Tester is preferred.

7. There are several specifications relating to testing for drying time and setting to touch. Normally, these tests are made on clear glass panels with known film thicknesses under con-




# Finishing Finesse that builds preference *for Jay Vee Shoe Trees*

For 6 years, the Jay Vee Shoe Tree Company of Brockton, Mass., a leading manufacturer of both shoe trees and lasts, has concentrated on Jewel Brand Resinoid Garnet Cloth Belts in its finishing operations. The company credits the super-smooth, true-to-the-grain finish produced by these belts for helping to build nation-wide preference for Jay Vee shoe trees. In addition, it states that for the operations involved, Jewel Brand Abrasives have no equal in production yield.

Jewel natural garnet cutting edges are toughened and tempered by a special patented process to last longer . . . cut cleaner, faster . . . and to fill less quickly. This means more production per belt, fewer replacements and lower labor costs.

There's a complete line of Jewel Brand Coated Abrasives in paper, cloth, and fibre for finishing all types of wood. Jewel Natural Garnet in belts and sheets and Jewel Brand Garnet Fibre for drum sanders are two of the leaders. Get all the facts and you'll see why a trial will be well worth your while. Contact your distributor, or write Abrasive Products, Inc., **551** Pearl St., South Braintree 85, Mass.

trolled temperature and humidity conditions.

Other standard tests would include tests for working properties, odor, safety of working, gas, percentage of non-volatiles, water, alkali, Kauri reduction and resistance to reagents and imprint.

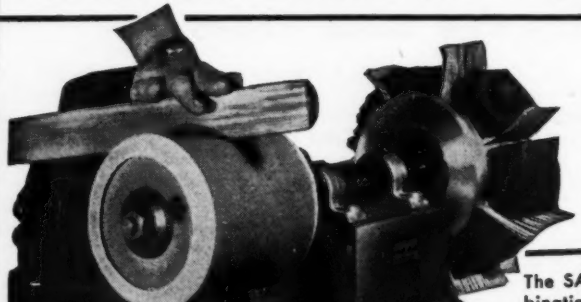
Many of these tests are employed only by the manufacturing formulators. In general, only a few tests are used by furniture manufacturers in testing incoming materials. The tests most commonly used would include viscosity, specific gravity, setting to touch, drying time and imprint tests.

### *APPLICATION*

Varnishes may be applied by spraying, dipping, brushing and roller coating although the former technique is the most widely employed. The application of several thin coats rather than one heavy one generally produces the best results and minimizes the possibility of orange peel and mottling. The mechanical film properties and the performance and durability of the topcoat are dependent upon the thickness of the film. The optimum film thickness may vary with the varnish employed as well as the product and its ultimate usage. The drying time of the varnish will vary with the formulation. Normally, slow-drying varnishes yield the greatest strength and durability properties; but since present-day production requirements do not allow for extended drying periods, some durability must be sacrificed for increased drying time and reduction of the dust hazard.

Varnish drying time may range from 4 to 36 hours although accelerated dry-


INCREASE SANDING PRODUCTION



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The SAND-RITE "DUO" is a combination pneumatic drum & rotary brush sander for faster sanding & lower costs on all types of irregular shaped & rounded contour wood products. Eliminate costly hand sanding & maintain top quality finishes by using the "DUO" Sander.

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## Smoother Sanding

**PEARSON BLOCK & EDGE SANDER**

**We Sell Direct!**
This enables us to personally instruct your operators to get maximum efficiency from the machine.

Today, when you must be able to produce the finest surface in the shortest time, at lowest cost, you should have this machine. Sands straight mouldings and round corners in one simple operation. Can also be easily converted to "straight-up" spool sander. Equipped with 3 hp. motor for 5 types of sanding—stationary mould block, hand slide block, curved edge, straight edge and spool (all types of curves). Pearson patented heads fit motor spindle. Write for details.

**We also make Scroll and Drum Sanders!**

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**HIGH POINT, NORTH CAROLINA**


ing may be affected by the use of temperature ovens or infrared. Many synthetic varnish systems require heat for film curing and will not develop the desired film properties at normal room temperatures. By using accelerated temperatures, varnishes can be adequately cured for further processing with one to two hours accelerated drying. Generally, a flashing period of approximately 30 minutes is recommended prior to the accelerated drying.

In general, varnishes can produce coatings with a maximum of desired film properties at a minimum materials cost. They are considered by many as less critical in application control technique, but cannot, to date, equal the rapid, dust-free drying schedules offered by lacquers.

Until the last decade, varnishes were the preferred topcoat materials for furniture finishes but lacquers have become the most widely used for topcoats because of their production advantages. Today, with the impetus from development work on synthetic varnishes, the use of varnishes in furniture finishing systems is increasing.

The higher solids (up to 50%) available in varnishes at spraying viscosity with good flow characteristics is one of their primary advantages. In general, varnish coatings can be applied to give greater build with fewer coats than is practical with lacquer for equivalence in durability.

### *VARNISH TROUBLES*

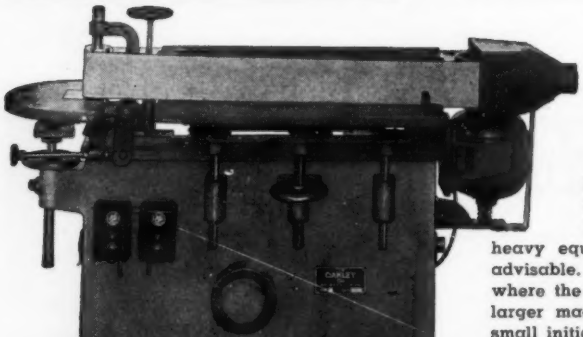
There are many problems that occur in varnish application. Most of these relate to faulty application technique or improper handling of the material.

**Blistering**—The formation of bubbles or blisters may be caused by the use of excessive heat during drying which allows for volatile expansion under a partially cured surface. Blistering may also result if the undercoats or the wood are inadequately dried.

**Blooming**—Blooming refers to the appearance of a milky or foggy surface. This condition generally relates to excessive humidity in the finishing or storage room. Condensation has been affected in the film. It may be remedied by rubbing and re coating. Humidity control in the finishing room and/or adjustment of solvents are preventative measures.

**Checking**—Checking is a mild form of cracking and may be affected by the same causes. Individual pieces may be adequately touched up in many instances.


**The OAKLEY H-6 LIGHT DUTY SANDER**



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Here's a light duty yet sturdily built Edge Sander designed for plants where floor space is at a premium and where heavy equipment expenditures are not advisable. Also in those departments where the size of stock does not require larger machines. With a comparatively small initial investment, the H-6 or H-6A can take its place in the production line or in the cabinet, pattern or assembly room. Reasonably priced. Write today.

Made in 2 models. H6 is the oscillating type and the H-6A which is non-oscillating. The latter machine is recommended for those plants where the oscillation of the sand belt is not required. Both models are reasonably priced. Send for full specifications and information.

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**Sample: $1.50 postpaid**
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**Chilling**—A chilled surface caused by solidification of gums, driers or oils may give a varnish film a sandy appearance. This defect is caused when the varnish is stored or applied at low temperatures.

**Cracking**—When a varnish topcoat cracks, it may have been caused by one or several variables. The most common causes of cracking are improper drying of the wood and/or the undercoats prior to topcoat application, severe temperature changes without adequate flexibility of the finishing system, and exposure of varnish films to chemical agents which may cause embrittlement. A varnish film may crack, creating a condition similar in appearance to the skin of an alligator. This type of cracking is often termed alligatoring.

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Reduce expenses by making your own abrasive belts and sleeves with the Econaway Abrasive Belt Splicer. Either the Floor Model or the Bench Model will make belts and sleeves of any length and from the narrowest up to fourteen inches wide, wider made to order. Any abrasive, paper or cloth back, may be used. Splices are set under high pressure with the thermostatically controlled Electric Press.
Both Models are precision built, to close tolerance, of strong material, modernly finished.
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*Write for Free Literature.*
*Manufactured and Distributed by*
**ECONAWAY MANUFACTURING CO.**
Bellevue, Michigan


**Crawling**—Crawling or roping is pronounced wrinkling and generally occurs due to the same causes as running or sagging. It relates directly to the flow characteristics which might be inadequate because of formulation, improperly cleaned surfaces, high or low temperatures and excessive application. An excess of drier is often the key to improper formulation. Normal recommended control in cleaning surfaces and in application will eliminate this problem.

**Flatting**—If the finish coat lacks the normal desired effect and has a somewhat dull appearance, it is described as flatting. It may be caused by dissolving inadequately dried undercoats or by excessively high temperature and humidity conditions in the plant.

**Pitting**—The appearance of little pock marks or pinholes on finished varnished surfaces is referred to as pitting or pinholing. This condition may be caused by inadequate drying of the undercoats and the escape of volatiles after the varnish has partially dried, by drafts in drying, or by improper atomization in spraying.

**Pull-outs**—Pull outs are caused when foreign matter is torn from an insufficiently dried film rather than cut off during the rubbing operation.

**Sinking-in**—If open-pored woods are not properly or sufficiently filled, the varnish coat may sink into the surface and a high polish is not obtainable.

**Sweating**—A gloss varnish rubbed to a dull finish under hot humid conditions often develops a greasy gloss which is described as sweating. It may be caused by application of varnish coats over insufficiently dried under-

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And in addition:
*Produce a stronger product with greatly extended life—an important new selling feature.
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CLAMP NAIL COMPANY
4542 West Palmer Street Chicago 39, Ill.

coats or rubbing of an inadequately dried varnish. Occasionally, this trouble can be overcome by additional rubbing following adequate drying together with elimination of the cause by correcting the drying schedule.

In recent years, with the increased acceptance of lacquer-type finishes, varnish manufacturers have, of necessity, launched an extensive program in research and development to produce and offer materials with comparable durability and working properties to compete favorably with lacquers. Perhaps the greatest impetus to varnish improvement has been the development of synthetic varnishes and the modification of natural varnish formulations with synthetic resins.

Combination synthetics have accelerated the trend toward the use of this type of finish in the furniture industry. Combination synthetics are improved resins of the alkyd and urea-formaldehyde family which have the ability to either dry at normal temperatures or at elevated temperatures. These synthetics show superior resistance to cold checking and to discoloration on aging.

A group of synthetic resins containing an epoxide group known by the generic name of epoxy resins, has, in the last five years, developed into an important surface coating material.

The Shell Chemical Corp. has done a major portion of the development work with these resins and offers eight types of epoxide resins for commercial formulation.

**The next article in this series will be on lacquers.**

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# WHAT'S NEW IN SANDPAPER?

By

John T. Robertson

*Manager, Technical Service Dept.*

*Behr-Manning Company*

THE furniture industry, once accused of a fondness for the old ways of doing things, has turned in recent years to eager acceptance of the forward look in machinery and equipment. Its suppliers are keeping pace with this trend. Sandpaper, for example, once considered a staple, has been improved, specialized and made more versatile until today it offers both faster and better production to the plant superintendent who's aware of these improvements.

Following is a summary of significant developments which are making the methods of even five years ago seem costly and inefficient.

## DRUM SANDING

Heavy-duty, fast-cutting abrasives have been developed to permit faster cuts and increased stock removal with triple-drum sanders. A drum cover of Resinall garnet fibre will remove planer marks in rapid fashion and, spectacular as it sounds, will last from 5 to 50 times as long as conventional drum covers. This remarkable sandpaper has a tough, sharp, garnet grain anchored tenaciously to a strong fibre backing by a special heat-resistant resin.

Also, new paper-backed drum sanding abrasives now available, will produce about twice as much as conventional drum papers, and offer an added advantage: because they are more flexible, they're easier to handle than the fibre-backed sandpapers. The paper-backed products are made with aluminum oxide or silicon carbide grains bonded with a coating of glue and topped with a film of resin. Generally, the aluminum oxide abrasive is preferred over the silicon carbide abrasive for woodworking.

## EDGE SANDING

Most edge sanding operations generate enough heat to weaken the bond on glue-bonded abrasive belts, and to burn the end grain. Here again a heat-resistant belt has been perfected, using aluminum oxide bonded to cloth with resin-over-glue and actually standing up two to four times as long as earlier belts. This construction was developed originally for metalworking but, as modified for woodworking operations, it is saving production costs for several progressive furniture manufacturers.

## MOLD SANDING

Mold sanding is sometimes called string sanding. Garnet cloth products are used almost universally in these operations. Garnet grain, because of its

*Editor's Note: This article proves again how important it is to have good communication between the supplier and woodworking manufacturer. Only in this way can we be sure the best materials and methods are being used. Keep in touch with your glue supplier, source of supply for finishing material and the manufacturer of abrasives used in your plant. In this way you may be able to cut costs and produce a better product.*

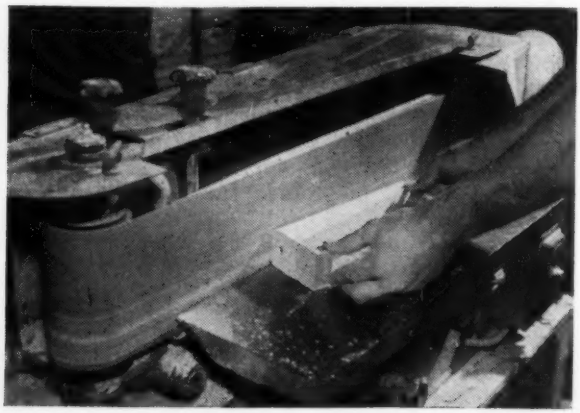
extremely sharp cutting edges, has long been the ideal product for wood sanding. Now, better heat-treating methods are improving the grain strength so that sharpness is retained longer than ever before. Garnet so treated can be identified by its color, a brighter red when compared with the yellow-orange of the old-type garnet. Because these cloth products must be flexible, a high quality animal hide glue is used. Now, these glue adhesives have been strengthened to hold the grit securely despite the severe creasing and flexing which the cloth must withstand in use.

Today's garnet cloth products give about 50% more mileage than 1950 models, and belt replacement schedules should be adjusted accordingly.

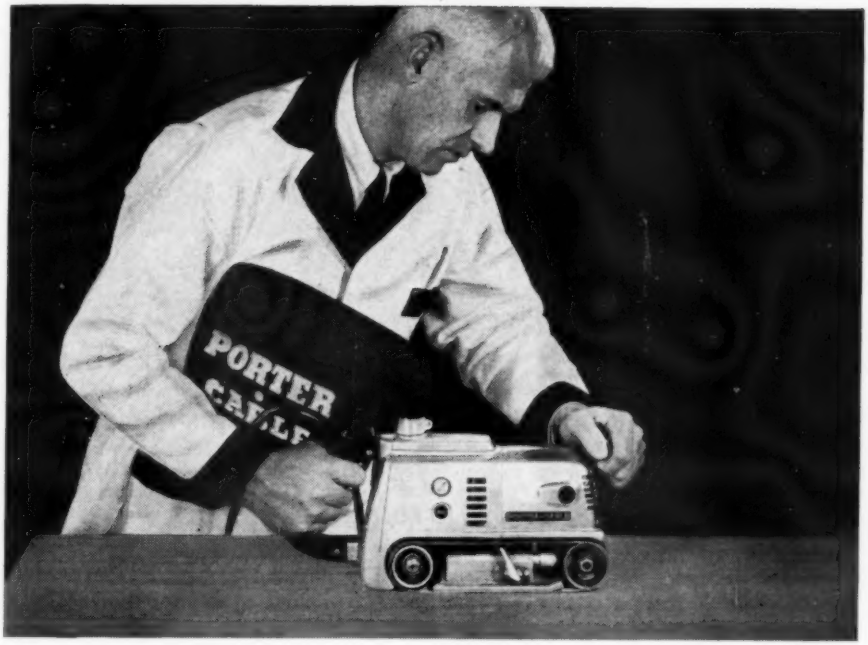
*For mold sanding operations like this, garnet is still the preferred abrasive, but new heat-treating methods have improved the grain strength. Cloth backing and animal hide glue are used for flexibility. The combination adds up to production per belt which is 50% greater than could be achieved even five years ago.*

## SEALER SANDING

Much has been written about the superior finishes produced with the



*Chair stump being edge sanded with one of a family of belts recently perfected to withstand the relatively high temperatures generated in this operation. The belt uses aluminum oxide abrasive bonded to cloth with resin-over-glue.*




# Up to 25% more production with this dustless belt sander!

Here's the lightweight, easy-to-handle dustless belt sander that's replacing old-fashioned machines and methods in wood working shops everywhere—Porter-Cable's famous Model 503.

Like every Porter-Cable tool, it's built for *performance*. It takes the toughest jobs in stride—chamfering, rounding edges, removing surplus stock—in wood, metal, plastics, and other materials. Yet, its straight-line sanding action gives you perfect, silk-smooth finishing on any surface.

Powerful vacuum system removes 83% of the dust—gives maximum abrasive life, increases production up to 25%. Model 503 does the work of heavier, far more expensive machines—yet costs only **$142.** It's a *value leader* in the Porter-Cable line of *quality woodworking tools*—see it at your dealer's, or write for full information today.

**Model 503 Dustless 3" Belt Sander—only $142.**

**PORTER-CABLE Machine Company**
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**Belt Sanders • Orbital Sanders**
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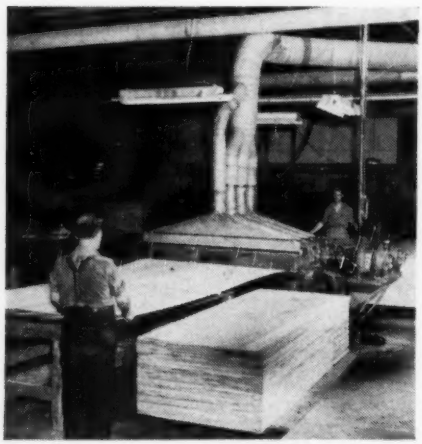
*Quality Electric Tools*

*Waterproof silicon carbide rubbing paper has made obsolete the papers used in the finishing room as recently as three or four years ago. Its special coating handles lacquers and synthetic urea varnishes now commonly used. Also, the paper requires no presoaking.*

new sealers containing no sanding aid. Specially treated "No-Fil" papers—available with either garnet or Durite (silicon carbide) grits—deliver superlative performance on these new sealers and offer extra long cutting life as well. These papers, incidentally, were designed for the furniture industry but their use has been widely adopted by the automobile industry for sanding prime coats before final lacquering or enameling.

### RUBBING

The waterproof silicon carbide rubbing paper, known as Tufbak, now being supplied to the furniture industry, is a fundamentally different product with two important advantages over



*Triple drum sanders take faster cuts and remove more stock than they formerly could, thanks to modern developments in abrasives. Very successful is a paper-backed drum cover to which aluminum oxide abrasive is bonded with resin-over-glue.*

*Wet rubbing a chair back with the new Tufbak paper. This picture is significant for the absence of the once necessary water bucket. The new papers need no troublesome presoaking in water.*

*Progressively finer grits on a triple drum sander, shown here sanding veneered panels, can now produce approximately twice as much as drum papers used previously.*

the "obsolete" rubbing papers of three or four years ago.

First, Tufbak is manufactured with a coating specially developed to give long cutting life and to resist loading. As a result, it produces a superior finish on the improved lacquers and synthetic urea varnishes that many manufacturers are now using.

Second, it can be used without bothersome pre-soaking in water for days, such as most rubbing rooms have had to do with any rubbing paper before the advent of Tufbak.

The old water bucket is a thing of the past.

The writer's company has introduced many new products to the furniture industry in the past few years, and has maintained a program of constant improvements in its standard lines. It is a fact that every woodworking item we manufacture has been modernized and improved at least once since 1950.


**ReNew** **GIVES NEW LIFE TO SANDPAPER AND CUTS SANDING COST 50%**

**Keep your sandpaper cutting for you with ReNew. Apply . . . let it dissolve the pitch or resin . . . then brush it off with a scrubbing brush. It's so easy and quick and makes your sandpaper last at least 3 times as long.**

**ReNew increases sanding machine efficiency . . . paper lasts longer . . . less changes necessary.**

*ReNew is non-inflammable.*

**Buy it in 55 gallon drums at $2.65 per gallon, 5 gallon steel pails at $3.00 per gallon, or 1 gallon cans at $3.25 per gallon. F.O.B. Moline, Illinois.**

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# new graduated siphon cup

## insures accurate paint reduction

Binks' new Model L-47 graduated siphon cup simplifies and speeds accurate paint reduction. The cup is legibly stamped with impressions marking 1-to-1, 2-to-1, and 3-to-1 ratios, as well as the 1-quart level. A steel reinforcement protects the base of the spun aluminum cup. The rolled edge and the large top opening insures a good seal on the gasket, strengthens the rim of the cup and makes thorough cleaning easy. These cups are adaptable to almost all siphon spray guns.

**For further details** about these new Model L-47 graduated siphon cups see your local distributor, or write:

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Many other improvements, and new products, are currently in various stages of development. To the furniture production executive, the moral is obvious: don't bet there isn't a better, faster or cheaper way to do the job!

### WELDWOOD CATALOG

One of the most attractive books that has come to our desk recently is this booklet by the U.S. Plywood Corp., 55 W. 44th St., New York City. Within 46 pages, the reader sees manufacturing operations, finished product and a great variety of applications.

The booklet is in color and serves as a guide to a large selection of high quality plywood and allied products. It contains concise, factual descriptions, recommendations, sizes and approximate prices for every product in the Weldwood line.

WHERE *Quality Counts*

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THE WOMAN chooses . . . and she selects tables that work smoothly . . . easily. That's why Wabash equipped tables sell better. Wabash Slides are precision made of hardwood . . . engineered for easy operation . . . with more than sixty-seven years of table slide "know-how" behind them. Write today for more information.

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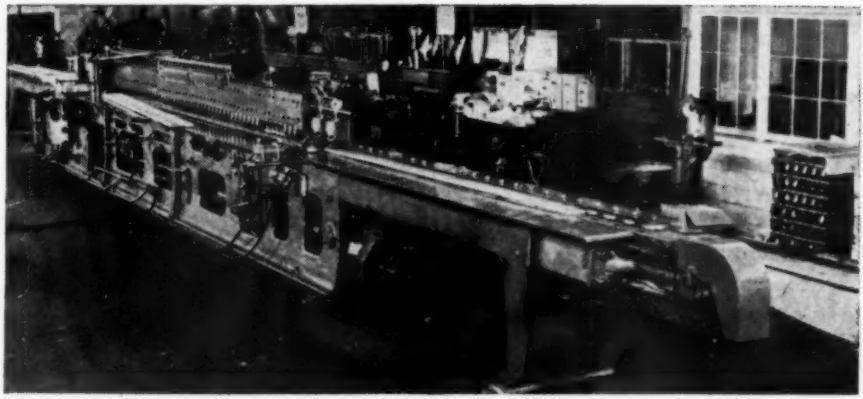
## NEW PROCESS JOINTS BOARDS



The new process makes use of the Linderman type double tapered dovetailing and gluing machine equipped with a special pneumatic straightening device and extensions. This permits the operator to form 1 x 8 foot boards up to 16 feet long from 1 x 4's, regardless of whether or not the boards are crooked. The manufacturer of this equipment says the process is practical for lengths from 10 to 16 feet.

The manufacturer, Muskegon Machine Co., Inc., Newburgh, N.Y., states that where cull stock is available in short lengths, stock can be worked into longer boards on the machine. It is also practical to work up panel stock in multiples of 16" to 12' length.

In forming a 1 x 8 from 1 x 4's, the two narrow pieces are fed from opposite ends of the machine on feed chains. Moving along roller guides, each board passes a pressure roller controlled by an air cylinder which forces the crooked narrow boards against the roller guides, straightening them with a force of approximately 400 pounds just as they reach the dovetailing cutters and the glue spreaders.

As the double taper dovetails are cut, the two boards feed into each other endwise, and the finished board is ejected from the center of the machine.

Feed chain speeds of 100 feet per minute are possible with this process, according to the manufacturer.

It has been announced that boards made by this process are accepted as "one piece stock" under U. S. Army Specification No. 50-62-4B. Inquiries made by Muskegon Machine Company concerning FHA acceptance of this jointed 1 x 8 and 2 and 8 stock "indicates that that agency has no objections to accepting it as quality construction material."

## TINT-M-TOTS

A versatile new coloring book idea, with crayons attached, is now being placed on the market by Harvey J. Lebow Co., North Andover, Mass. Known as "Tint-M-Tots," this novel item will have its greatest use in the retail furniture store. The booklet, as produced for the furniture industry, emphasizes the child and his surroundings.

The drawings are simple, easy-to-color line drawings. Each illustration is accompanied by a brief piece of copy prepared for suggestive selling. Typical remark might be, "Everyone can watch TV on the big curved sofa," etc. This is a novel idea and certainly should help in educating the public toward wanting good furniture—well built and purposefully designed.

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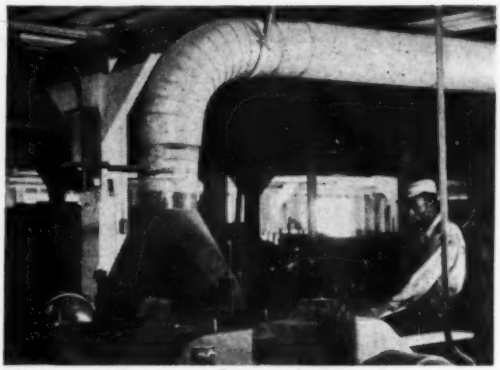
**MATTHEWS ENGINEERING KNOWHOW CAN SOLVE YOUR DUST PROBLEMS!**



Blow pipe systems and dust control pay off! Keep air clean, pure . . . help eliminate fire and health danger! Lower insurance rates; maintenance and production costs! Mean bigger profits to you!

Matthews' 30 years of designing, engineering, fabricating and installing adequate blow pipe and dust control systems assure you the size and type system that best fits your needs! Custom built according to your plant specifications and requirements.

Let Matthews show you how to handle refuse and control dust from source to disposal!

Call, write or wire Matthews today!

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**125 Keel Avenue** **P. O. Box 1420** **Memphis, Tenn.**

**Phone 8-6352 or 8-6353**


## COMMERCIAL STANDARD FOR HOLLOW CORE DOORS

A new commercial standard, CS 200-55, for hardwood veneered hollow core flush doors became effective September 20.

This standard was proposed by the National Woodwork Manufacturers Association and circulated to the woodwork industry by the Commodity Standards Division of the U.S. Department of Commerce. Satisfactory acceptance of the voluntary standard by the industry enabled the Department of Commerce to declare it a commercial standard.

The standard covers construction, grades, tolerances, method of tests and labeling with provisions for grade marking of hollow core flush doors. Copies of the standard may be purchased from the National Woodwork Manufacturers Association, 332 South Michigan Ave., Chicago 4, Illinois.

# *New...* 24" SINGLE DRUM ENDLESS BED SANDER

This non-oscillating 24" drum produces smoothest kind of sanding on hard or soft wood. Drum is of metal construction, 24" long, 14" diameter, felt covered, with spring action lock keeping sandpaper snug and tight. Non-oscillation of drum leaves no cross streaks. Has variable rate of feed, 15 to 30 feet per minute. Can be stopped and started while machine is in operation. Feed works fitted with grease fittings for lubrication. Endless bed fitted with rubber inserts. Frame is of welded steel construction, cabinet type, rigid, with doors on both sides. Has capacity for material up to 6" in thickness. Standard machine has capacity for stock as short as 15". On special order — machine can be fitted with two extra Idler rolls to handle stock as short as 8". Dust hood easily removed for changing sandpaper or for sanding curved work on top of drum. Drum bearings have pregreased sealed races. Idler rollers mounted on sealed tight ball bearings. Machine driven with 3 HP motor 220 Volt, 3 Phase, or 110/220 Volt, Single Phase double Vee belt drive, with starter. Weight 650 lbs. Floor space 46"x40".

**Complete with motor platform, grooved pulleys, endless belts, wiring and starter.**

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**220 South Jefferson Street • Chicago 6, Illinois**

# keep your production pace "hot" with Borden casein glues

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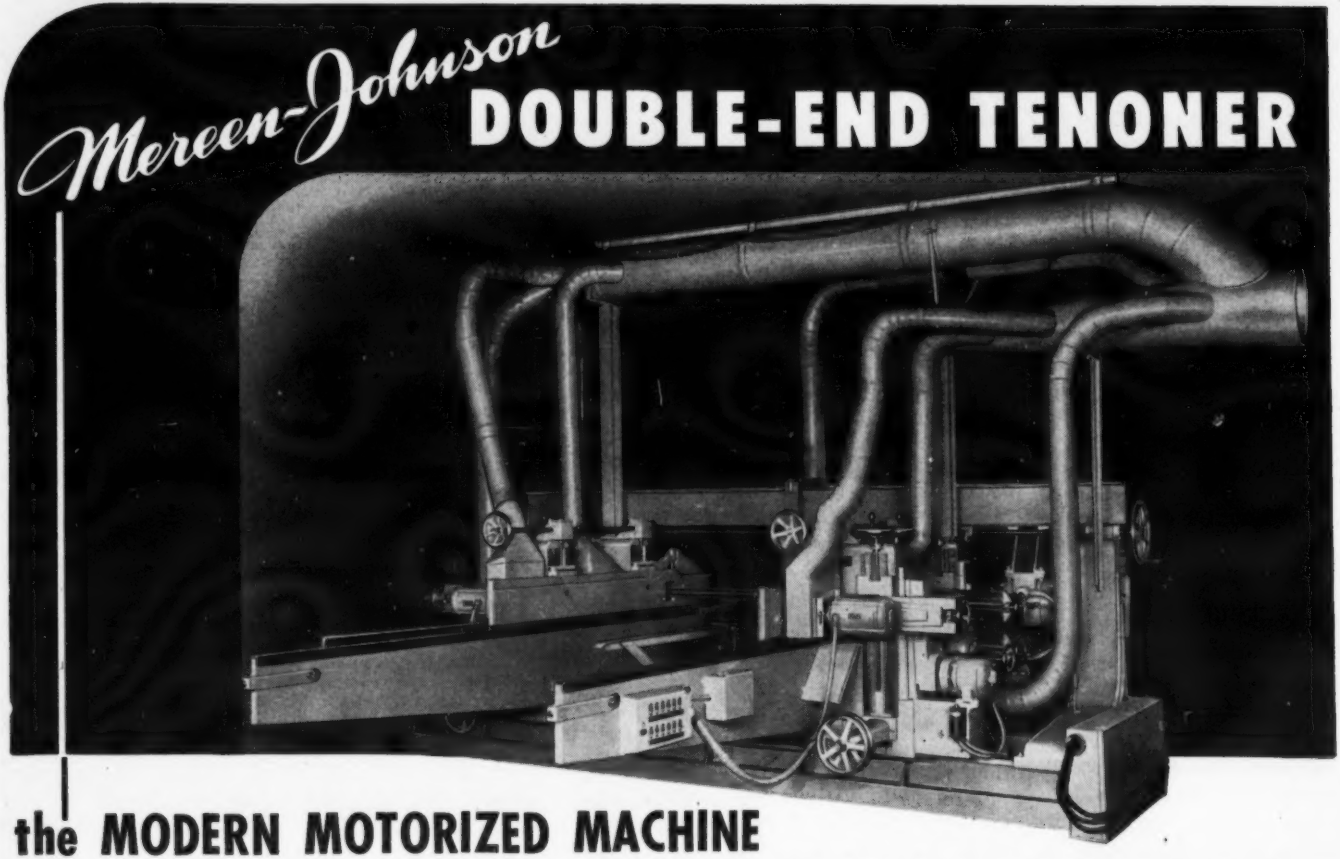

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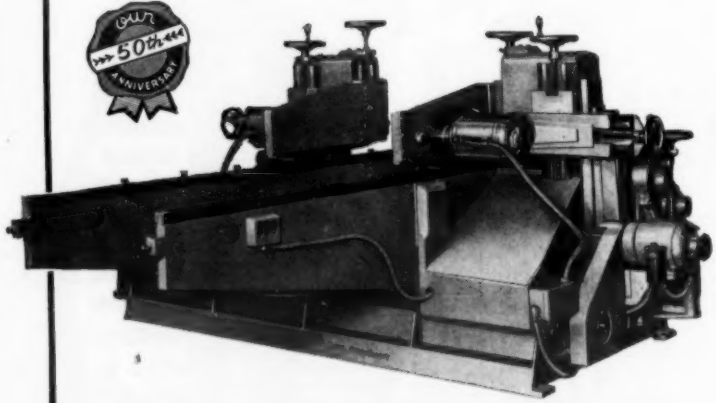


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## FEATURES

**Mount Washington TV Transmitter of Plywood**

By Thomas D. Perry

**Lamination Improves Hull Design of Wooden Ships**

Part II

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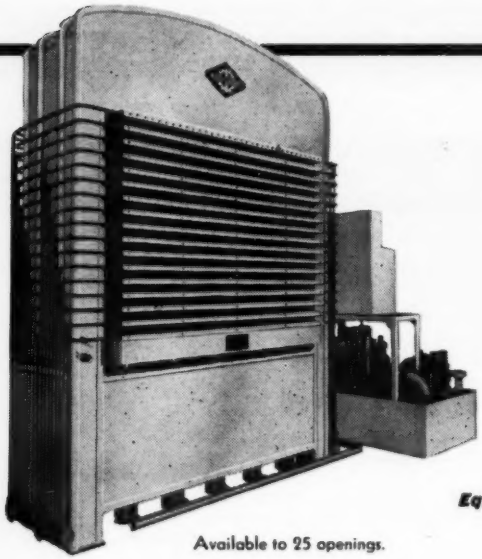

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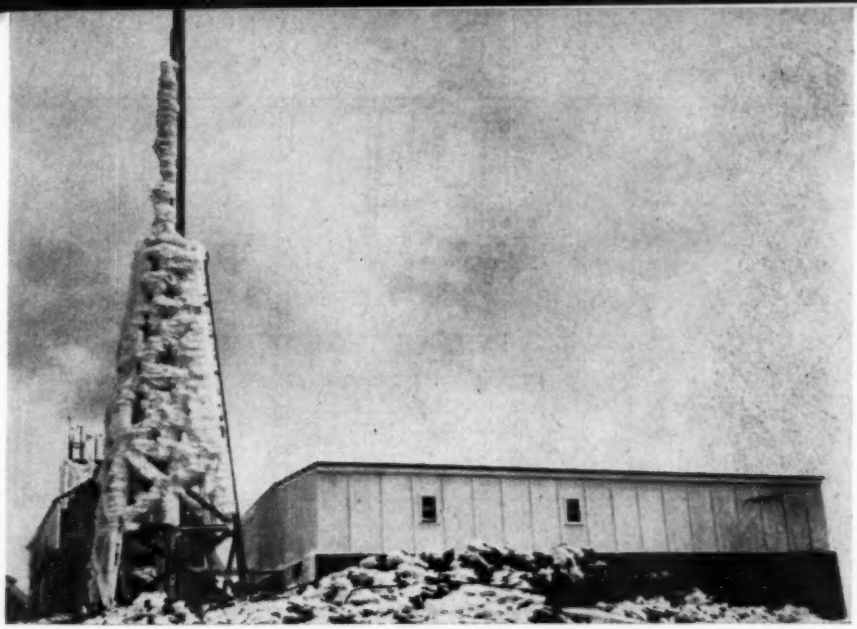

# MOUNT WASHINGTON TV TRANSMITTER OF PLYWOOD

**By Thomas D. Perry**

OVER the years plywood has found its way into dramatic and extraordinary applications that give a thrill, even to an old-timer in the industry. The case in question is the electronic transmitter and relay station recently erected on Mt. Washington, New Hampshire, 6,288 feet above sea level, and the highest point in the United States east of the Mississippi River. The construction was plywood throughout. A view of the completed station, from the south, is shown at the beginning of the article. Note that it is low and hugs the mountain top. At the left rear is the United States weather station that has been there for many years. The photograph was taken in September and the steel transmitter tower, approximately 100 feet high, is seldom free of ice. Under the winter sun, huge cakes of ice drop off from time to time, a menacing hazard for nearby buildings.

The purpose of this transmitter station at this maximum altitude is to receive and forward programs from the WMTW broadcasting studio at Poland Springs, Maine, some 50 miles to the east, and at a much lower alti-

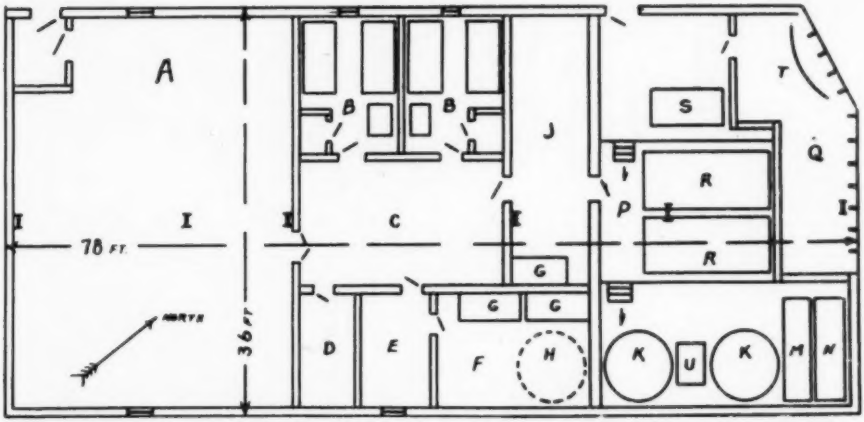


*Fig. 2. Floor plan of WMTW-TV station. A transmitter room; B. bedrooms, two; C. living and dining room; D. bathroom; E. kitchen; F. food storage; G. food freezers; H. drinking water tank, below floor; J. workshop and storage; K. washwater storage; M. lubricating oil storage; N. day storage of fuel oil; P. powerhouse with three floor levels; Q. plenum chamber for receiving; R. two 175 kw Diesel generators; S. Disel generator, 50 kw for deicing; T. "dish," 10' diam. for receiving; U. oil heater.*

tude. It is estimated that this new sky-high station will serve some 25,000 square miles, including most of New England and the adjacent areas of New York State and Canada.

Difficulties were clearly foreseen when this project was proposed. Mt. Washington is famed for its freakish weather, which is considered more unpredictable and erratic than anywhere else in the world. Winds of more than 230 m.p.h. have been recorded there and 140 mile gales are far from uncommon. There is seldom a month without snow fall and drifts of hail stones are not infrequent. Heavy fogs are common and are almost as drenching as rain storms. The project was a challenge to the broadcasting company and to its backers. Since when has Yankee ingenuity failed to meet a challenge, even against almost insuperable obstacles? It is to be noted that this objective was what might be termed a luxury to please and satisfy thousands of customers. It was in no sense an emergency or a necessity. Nevertheless, this service goal was considered well worth the cost in money, effort and labor.

### *THREATENING OBSTACLES*

There was not only the extremely freakish weather to contend with, but there were almost unsurmountable problems of transport. The mountain, the cog railway and the Summit House, a summer hotel, are owned and operated by Dartmouth College. Mountain land can only be obtained through long term leases, with the lessors required to buy water from the owners, when the pumping system is operable during the summer months, at a price per gallon far exceeding that of gasoline for automobiles! The antiquated cog railway, run exclusively for sightseers, is not adapted to freight, as the two available passenger cars have slanting

*Fig. 3. Typical wall section ready for insulation.*

floors, are equipped with seats, and only moderate loads can be hauled by the small puffing steam engines. It operates only during the tourist season.

There is a tortuous gravel road up the mountain, some 8 miles long, hazardous even for passenger cars and positively dangerous for the races each summer, which are patronized only by dare devil drivers. The grades are steep, the curves are sharp, and the width most of the way up is barely enough for passing, and too narrow at many points. The problem of hauling up machines weighing more than 20 tons and the wind hazard against 40 foot trailers would have deterred any but the most courageous companies. However, Lavinge's Red Express Company of Berlin, New Hampshire, veteran mountain truckers, undertook and completed the job, but frequently the odds were heavily against them.

It was stipulated that the road must be clear at 8:00 a.m. for tourists, but there were many occasions when emergencies interfered. Heavy trucks took about four hours on the up haul if everything went well. Hence, the loaded trucks had to assemble at the foot of the mountain the previous night and start the ascent at day break, or even earlier. With luck they might get up and be unloaded for the return trip by 8:00, sometimes by 9:00. The last turn at the top was the toughest, and not infrequently part of the load had to be shifted to small trucks for this last half mile. In some cases winches were needed to boost the heavy trucks over this last hump. Fog, snow, hail, rain and utterly exhausted manpower frequently brought progress to a halt. Walking pilots sometimes had to precede the trucks by 100 feet to keep them on the road. It proved to be an epic in transportation.

Another phase of the problem was to design a building for this eastern mountain peak, that would not only house extremely delicate electronic equipment to relay from Poland

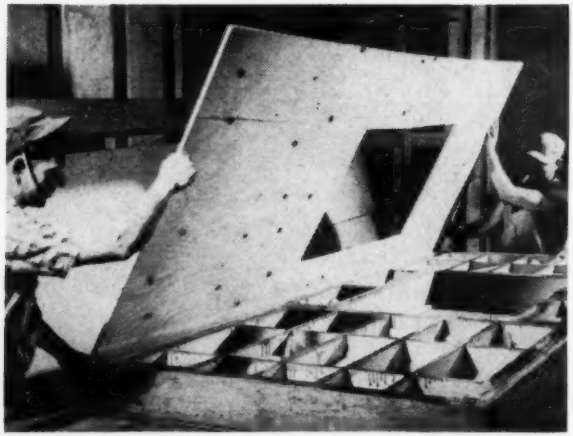

*Fig. 4. Final plywood layer on wall section.*

Springs, and to protect it from the elements, but would also serve as working and living quarters for the technical crew during the bitter cold, as well as the driving winds and snows of the winter seasons. There might be days, even weeks, when zero would be a high reading and the winds would exceed 100 m.p.h., with occasional gusts over 200 miles. The station would have to be self sustaining for long periods in the winter months, when the mountain road would seem to be impassable except for Eskimo sleds and huskies. However, the U.S. weather station, established on the mountain top for some years, had demonstrated that "snow cats" could wind their way up over the snow slopes, disregarding the roads, and maintain occasional communication between the bottom and top of the mountain.

Then there was the third difficult problem of erecting the building in the short summer season, with the minimum of mechanical equipment that could be maneuvered up to the summit. The strong winds would always be menacing in handling bulky materials on any construction project.

The engineers and architects entrusted with the task of designing the building, as a WMTW-TV transmitter station, connecting Poland Springs with the rest of the United States, explored many types of designs and investigated a wide variety of building materials. They were familiar with the fact that plywood had been successfully used in prefabrication, and could be designed to provide a maximum of rigidity with a minimum of weight, and with excellent insulation. This involved prefabricated units, of a stressed skin construction, which provided hollow or semi-hollow interiors that could accommodate insulating materials. This was the starting point of the design. Supplementing these prefabricated units must be a rigid steel framework, to tie these units together. Still further was the requirement for a reinforced concrete foundation, which was anchored firmly to the mountain top. This anchorage must be strong enough to withstand terrific winds and must be deep enough so that neither periodic nor continual frost would

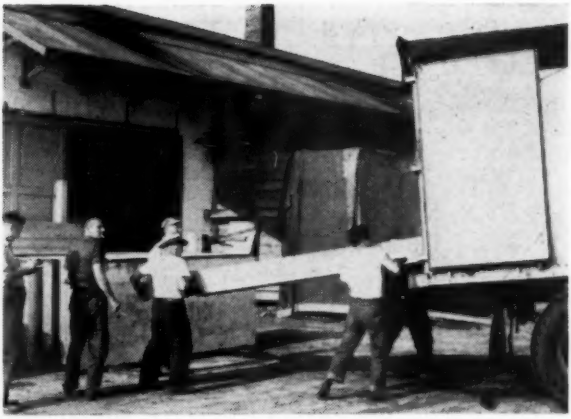

*Fig. 5. Loading the trucks at the Manchester factory.*

weaken its grip to the stone ledges on which the foundation rested. There was little precedent to supply the basis for calculating these stresses never-before-experienced. The designers had to provide an adequate factor of safety for any emergency that might occur on such an exposed location.

In order to combine these theoretical requirements in a structure which was practical to build, on a reasonably economical basis, the engineering staffs of the Douglas Fir Plywood Association of Tacoma, Washington, and of Keller Products, Inc., Manchester, New Hampshire, were called into consultation. Affiliated with the latter was the Plywood Wholesale Company, Inc., Manchester, who supplied the plywood required, especially designed to meet the exacting requirements of this exposed location. Also consulted in the completion of the plans were many other companies, which supplied the hardware, doors, windows, insulation, roofing, plumbing, heating, electric wiring and flooring, not to mention the fixed and portable equipment for human comfort and electrical efficiency.

The final result, after months of cooperation, was a design that met the technical requirements of WMTW, that would withstand the extreme weather conditions on the exposed mountain top; that could be assembled, so far as possible, at the Keller factory at Manchester for transportation some 100 miles to the site; and that could be erected on the foundation, during the short summer season, in a minimum of time, and with the assurance of maximum effectiveness and durability.

The actual erection was by workmen from the Keller plant, who had assembled the prefabricated units, and were familiar with the right way of erecting them. In reality it was a mammoth jig-saw puzzle, to fit every unit into its right place in the shortest possible time, without regard to unfavorable weather conditions. Those are the many facets of the problem which had to be faced, and here is how the difficulties were surmounted by the intelligent utilization of plywood.

## *MANUFACTURING THE PREFABRICATED UNITS*

The order for supplying the wood parts, for prefabricating them into

units, and for erecting them on the site, was given to Keller Products, Inc., who had been so deeply involved in the design, and who understood better than anyone else the various problems ahead of them.

The general floor plan of the building, 78′ long by 36′ wide, is shown in Fig. 2, and the major features are indicated in the captions. In general, the left end of the building, adjacent to the tower, is the transmitter room for distributing the broadcasts and is occupied with complicated electrical equipment (see Fig. 13). The right end, designated as the powerhouse, contains the Diesel operated electric generators, tanks, heater, etc. The two 175 KW units are for power and lighting; the 50 KW generator is for deicing the tower, with enough power to melt the steel if applied when there is no ice on the tower. At the far right is the receiving section, taking broadcast from Poland Springs by means of a 10′ diameter "dish." Part of the exterior wall on the northeast consists of wood studding with fiberglas sheeting, which offers no impediment to clear reception. The central section provides living quarters for the crew plus a small workshop, with adequate storage for six to twelve months' provisions and supplies.

*Fig. 6. Starting the plywood wall at one end.*

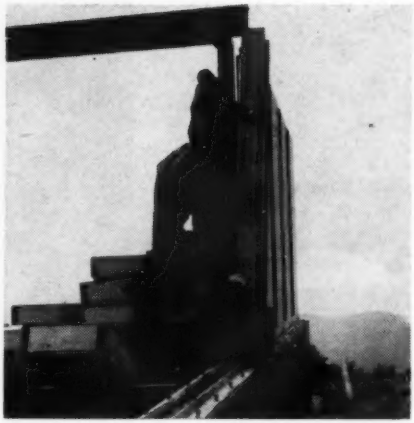

*Fig. 7. Inside view of starting the plywood wall.*

These accommodations are for a rotating crew of three, two being constantly on the job, while the third man has the week off, if by any chance he can get down the mountain in the winter months. The plywood partition adjoining the power room is faced with aluminum clad plywood as an extra protection against fire and hard usage. Outside the building and on a rocky shelf below the last difficult turn in the road, is a "tank farm" of 5 large tanks for oil storage, with an aggregate capacity of 100,000 gallons, to carry over any possible emergency of impassable roads.

There were some 200 prefabricated plywood units required, of various shapes and sizes, each specially designed with 2″ x 6″ or 3″ x 6″ frame and cross members for firmly holding the units to their neighbors, to the foundation or to the steel framework.

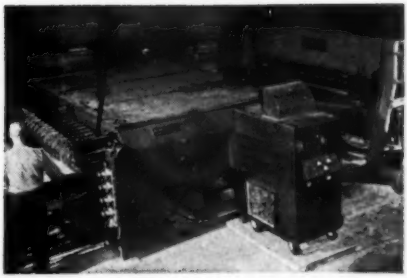

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*Fig. 8. Finishing the first corner.*

This steel frame was reduced to a minimum, consisting of 6 steel "I" columns and a lengthwise steel "I" beam, serving as a ridge pole to support the roof. Supplementary to this steel frame are numerous steel angles to bolt the units to the foundation, to stiffen the intersecting corners of the outside walls and the load bearing partitions, and to anchor the roof (inside and outside) to the walls, partitions and steel ridge member. While the floor sections rest on the foundation, all other load bearing is carried by the plywood units.

There were roof, floor and wall units, timber framed, and faced with plywood on both sides. The interior of each plywood section was criss-crossed with wooden grids, notched into each other, and as thick as the frames. These grid openings seldom had an area greater than one square foot. In each opening was a pad of fiberglas insulation, about 2″ thick, fitted snugly and glued in place. This construction is shown in Figs. 3 and 4, representing a typical wall section, with cutout for one of the few windows provided. Intermediate 2″ timbers were inserted in the grid work wherever the use of anchoring bolts was anticipated. The wall and partition sections measured up to 4′ x 10′ and the floor and roof sections ranged up to 4′ x 18′. Stud and joist members were mostly 6″ wide, with occasional heavier or more frequent members either for bolting or concentrated loadings. The plywood layers varied in thickness according to location, ¾″ 5-ply for the outside and ⅜″ 3-ply for the interiors being the general rule. Allowable floor loads were 60 lbs. per square foot where equipment was located, and less under the living quarters. All heavy machines and tanks were mounted on concrete foundations.

The roof required a special design to withstand the impact of the chunks of ice dropping from the tower, and to distribute these unusual stresses over a wide area of roof. Therefore the roof

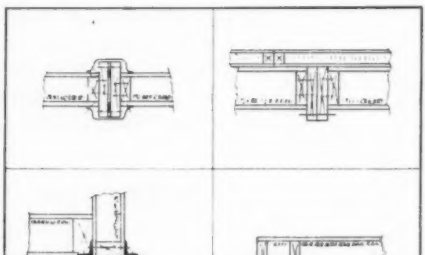

*Fig. 9. Types of joints employed. Upper left: horizontal section of outside wall joint. Upper right: vertical section of double roof. Lower left: vertical section, wall and floor to foundation—note steel angles. Lower right: horizontal section of wall corner, which is typical of steel angle anchors at all vertical corners of bearing walls and partitions; also of walls and partitions under roof and ceiling.*

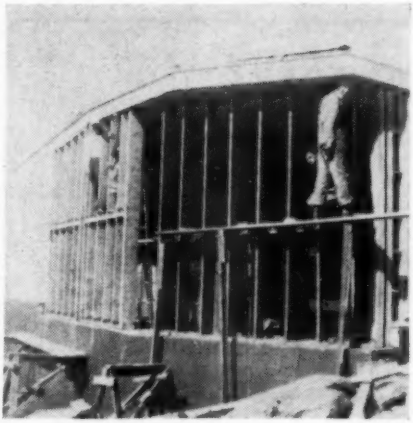

*Fig. 10. Receiving end, to be covered with Fiberglas.*

consisted of a double layer of plywood units, the lower being the usual insulated plywood grid construction, similar to that shown in Figs. 3 and 4, and the upper having a special construction, some 2″ thick, consisting of two covering layers of plywood and a 1½″ central layer of end grain balsa wood. A section of this double roof is illustrated in the sketch of Fig. 9.

These roof sections were exposed to an unusual hazard, in addition to the normal rain, snow and wind stresses, i.e., that of large blocks of ice falling from the tower, in spite of the deicing measures. In order to be certain that the design would not be damaged by such an event, a 6′ square of double roof sections was prepared for a pilot test. It was mounted over supports under the Queen City Bridge in Manchester. Then two blocks of ice, weighing 200 lbs. each, were dropped 50 feet from the bridge railing above to land on the center of the test panel. No one was too sure what would happen. The ice blocks were shattered, but a careful inspection revealed no damage to the plywood unit. Every one heaved a sigh of relief! That settled the question of roof design. However, the "grape vine" advance reports had brought so large a crowd to watch the tests that the ire of the city and state police was thoroughly aroused at the unexpected blocking of the bridge for an hour or so. Some "tall" explaining was required, and a severe reprimand was the final result!

These sections were all prefabricated at the Manchester factory by the same working crew that were later to erect them on the mountain top. All units were marked with letters and numbers for ready identification on the site, and a careful schedule was prepared for hauling them up in the right sequence. Suitable storage space was so limited on the mountain top that to haul up the roof sections ahead of the floor sections would have been little short of catastrophe. The high winds were another on-site storage hazard. One section, weighing some 500 lbs., was completely lifted off the pile by a strong gust, and dropped along side, fortunately without damage.

A view of loading the trucks at Manchester is shown in Fig. 5, and in the rear can be noted several stacks of completed sections, partly covered by tarpaulins. The trucking company was lucky to make one trip per day, considering the 100 miles of highway and 4 hours up the mountain, including the loading and unloading time. But it was all in a day's work!

## *ERECTION*

While the excavation and concrete foundations are perhaps a bit outside the plywood field, they deserve a brief description. The markings on the concrete foundation prove that plywood

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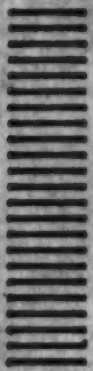

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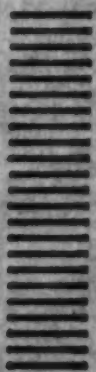

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*Fig. 11. Operating interior of transmitter room.*

forms were used. The digging for the footings was largely by hand, as no bulldozer could function on the rough and steep edges of the mountain top. Some 150 holes, 1½" diameter, were pneumatically drilled into the rock, less than two feet apart and some 5' deep. One inch rods were cemented into these holes, extending upward 18" into the poured foundation. Seldom, if ever, was such costly water, over 50c per gallon, used in a cement mixer. The terrain was low at one corner, and here foundations were laid for the heavy oil and water tanks. The larger machines and tanks were placed before the walls were started. They were much too large to go through any doors. Doors and windows had to be kept at a minimum, to guard against "exploding" the building by a terrific gust of wind. Two rows of long lag bolts were bedded in and along the top of the concrete walls, some 18" apart, to which steel angles were bolted, just far enough apart to accommodate the plywood wall units. Every wall unit was rigidly fastened down to the concrete wall by bolts extending through the unit and the angles. It would be an ambitious gust of wind that would lift the plywood building loose from the mountain ledges!

The actual erection started at one corner, as is shown in Fig. 6, taken outside the building. Extra wide planks were spiked to each edge of the wall panels, with protruding edges through which the sections could be bolted together. A generous application of mastic was placed in each joint. Another, and inside view, of this start is shown in Fig. 7, where the steel columns and overhead central beam can be seen; also the 50 lbs. pail of mastic compound! The improvised "A" hoist for the sections is to be noted at the left, also the long floor sections serving as a temporary scaffold. In the dim and foggy distance can be noted a panorama of the other peaks of the Presidential Range, with intervening clouds. In spite of the many handicaps it must have been an inspiring spot on which to work!

At the start it was not enough to bolt the wall units down, they had to be braced and shored against the chance

of overnight storms. The erection crew lived at the Summit House, and more than once the superintendent was aroused by a summer storm late at night, and anxiously had to check his careful safety precautions. When it was possible to complete one self-bracing corner, this anxiety decreased markedly.

Fig. 8 shows the corner next to the tower. Details of several of the more important types of joints are shown in Fig. 9, and described in the caption. Metal cover strips were nailed over all exterior wall joints, as a slight tribute to appearances. The building was entirely utilitarian, placing emphasis only on weathering the mountaintop winter, and protecting the delicate instruments employed. These cover strips also gave an added deterrent to wind seepage through the walls. Steel angles were bolted or screwed in every corner where they might contribute to the sturdiness of the structure. This was especially true of anchoring the roof to the walls. The underside of the roof sections were slightly notched to rest between the flanges of the metal ridge. The inner ends of these roof sections were spliced together below, by a 2″ plank bolted to the plywood ends and the steel beam. An acoustic tiling was installed on the underside of the plywood ceiling units. A 5-ply tar and gravel roofing and exterior painting put the final touches on this extraordinary building.

Part of the building, to the north, and toward Poland Springs, could not be of plywood, since it might interfere with TV reception. Here vertical studding was erected, 2″ x 6″, and faced on the outside with sheets of nearly transparent fiberglas and which was also transparent to micro-waves. These were made of a polyester resin, reinforced with woven glass fiber fabric and was 3/16″ thick.

The photo in Fig. 11 is an interior view of the transmitter room, after it was in full operation, relaying TV broadcasts over an area estimated to be 25,000 square miles.

The weather might have been propitious for the 30 days required for the major erection work, but it was not. It was the worst summer ever recorded at the Mt. Washington Weather Station. Both "Edna" and "Carol" happened along during the period, and were much more disheartening to the crew than disturbing to the building. The partially erected structure stood up magnificently under the gales which registered up to 142 m.p.h. One of the Fiberglas panels was blown far down the mountain, but retrieved without damage. One of the saw horses used on the job was "stolen" by the wind and never found! Many of the days in September the crew worked in hail, rain or snow, in addition to the wind. Some of the days were biting cold.

That is the intimate story of an unusual epic in competent design, and in erection under extraordinary weather conditions. It is also a remarkable demonstration of plywood utilization. No other building material could have met such severe conditions. The building has now been in service for more than a year and has fully realized the expectations of those who were participants in the project.

The data for this story has been obtained through the courtesy of Keller Products, Inc., and the Douglas Fir Plywood Association. Photo credits are due to Eric M. Sanford, Manchester, N. H.

# LAMINATION IMPROVES HULL DESIGN OF WOODEN SHIPS

**Part II**

A. MEREDITH JOHNSON
Hull Design Section, Bureau of Ships
U. S. Department of the Navy

THE lessons taught by ships of an active era of wood ship design and the experience gained from consultation with numerous designers and builders of long experience, resulted in the decision to design the hull of the 165′ minesweeper as triple planked with two courses of ¾″ planking laid double diagonally at 30° to the fore and aft, and a single course of 2½″ planking laid fore and aft. This system achieves lightness by providing great hull strength in torsion and shear; disposes the unidirectional properties of wood in three directions thereby making a system of construction of more homogeneous nature; provides more efficient longitudinal strength in bending by virtue of increased shear rigidity; and eliminates metal strapping as shear carrying members. The elimination of metal strapping is of definite advantage.

## *FRAME LAMINATING*

The decision to use laminated framing extensively posed several serious problems. First in order of importance was selection of fabricators of the

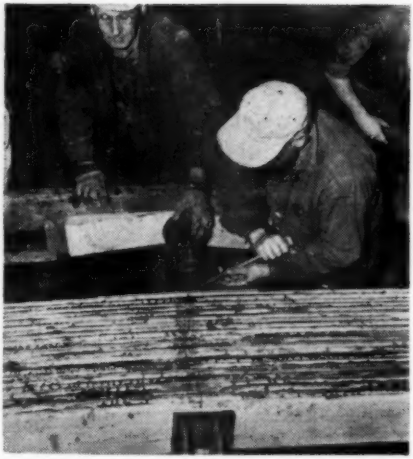
*Plys for complete frame arranged in order of assembly.*

frames. As has been mentioned the frame would have to be manufactured as one piece from frame head to frame head. The hull dimensions were such that the majority of frames would be too large to ship by means other than water or special truck. In the event of an accelerated building program this would be impractical as limiting the fabricator to regions of navigable waters or require setting up complicated and cumbersome highway routes.

*Frame at start of assembly.*

The obvious solution to the transportation problem was to depend upon the professional laminator only when he was convenient to a shipyard. In the majority of cases the yard would not have a ready source of supply and would have to manufacture the frame in its own plant. Thus, the whole success of the program from the very outset depended upon the ability of a shipyard, generally ill-equipped for large scale laminating, to enter successfully into a new field. The question was further complicated by the selection of oak as the preferred material for the frames, necessitating relatively high curing temperatures and close humidity control.

The laminating of large wood structures is a specialized process generally requiring machinery foreign to the average shipyard. Acceptable tolerances for board thickness and surface preparation are low; gluing and assembly necessitate special skills and time control; pressure requirements in clamped condition necessitate specialized equipment; and curing of the assembly, one of the most critical aspects of the process, requires close temperature and



*Frame in open assembly at start of final clamping.*

humidity control. The manufacturers of laminated structures have, through the years, evolved and equipped their plants with specialized surfacers, glue spreaders, clamps, and kilns. To equip each yard with this expensive equipment would be impractical.

Since the success of the program depended upon the ability of the shipyard to manufacture their own frames, contracts were let with Luders Construction Co. to build a full scale U-shaped frame of oak and with the Wheeler Shipyard Co. to build a full-scale U-shaped frame of Douglas fir. Each company developed their own techniques and solved numerous problems in able and workmanlike manner. Much credit for the initial success is due the various organizations and people who acted in an advisory capacity to both companies. The personnel of the laboratory of Timber Engineering Co., the Forest Product Division of the Department of Agriculture, Messrs. Kuenzel and Cranch of the Wood Products Branch and Lts. Noyes and Latase of the Raw and Basic Materials Branch of the Bureau of Ships gave freely of their time and experience to help insure success of the project.

Upon completion of the two frames, each was cut into test sections and shipped to the laboratory of Timber Engineering Co. for strength and delamination tests. All sections yielded strengths substantially equal to values

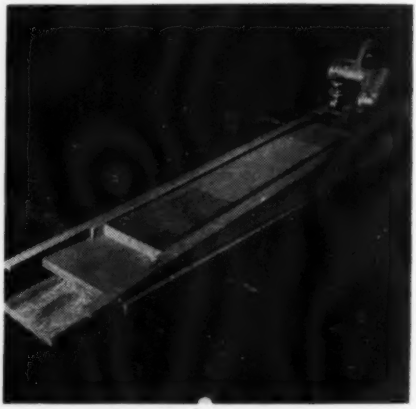
*Frame in closed assembly and clamped priór to covering with canvas blankets.*

*Frame covered ready for curing.*

expected of small clear laboratory specimens of the species. This in itself was highly gratifying since comparable results could not be expected of solid high-grade timbers due to the unavoidable defects and variability to be found in large timbers. In addition, the block shear and delamination tests met all specified requirements and established without question that the techniques used by the shipyards were practical and resulted in strong and durable members. The wood shipbuilding industry has taken a major step forward in the development of new construction techniques due to the able pioneering of these two companies and their advisors.

Steps in the manufacture of the oak frame are shown. The bed upon which the frame was assembled was made up of I beams with steam coils and steam jets arranged underneath. The individual plies were pre-scarfed, end-glued and arranged on the glue bench in proper order for assembly. At least six plys are continuous boards over 70′ in length. Curing of the glue was accomplished by means of heat from the steam coils retained within a blanket of two layers of heavy canvas. Temperatures ranged from 150° F to 180° F.

The tests proved that oak frames could be manufactured entirely within the plant of the shipyard. That hurdle having been overcome, it was obvious that other members of more simple construction would not present formidable problems to the yards. In addition, the



*Jig for scarfing for end gluing.*

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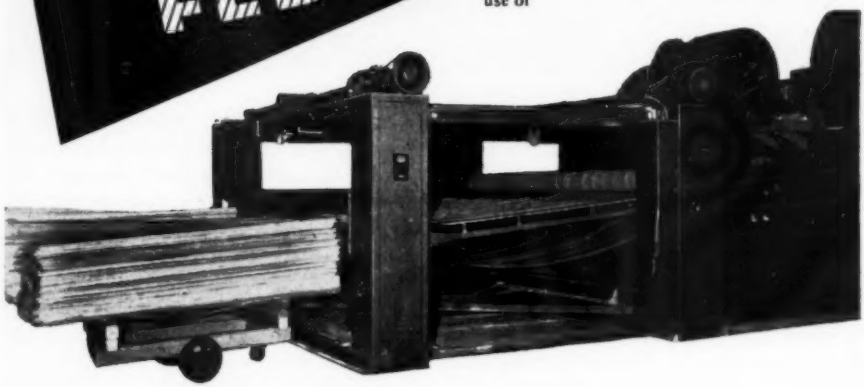

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*Frame in closed assembly and clamped.*

strength tests made on sections of these frames proved the excellence of laminated construction for large beams. This led to the final decision to use timbers in as long lengths as could be handled by the yard. The backbone of the vessel consists of a one-piece stem, a one-piece 12″ by 12″ keel over 100′ long, a one-piece 12″ by 9″ keelson also over 100′ long, and a one-piece combination horn timber, keel and deadwood. All deck beams, stringers, girders, wood knees, large foundations and filler blocks are of one-piece laminated construction. The only exception is a few deck girders which were made up as a lower laminated one-piece flange with shear blocks secured to it with adhesive and placed to fit between deck beams, the top flange being a one-piece laminate forming a portion of the deck planking and being fastened to the lower assembly by bolts and split ring connectors. Later in the building program some yards requested permission to attach the upper flange by adhesive in place of bolts.

## *RESEARCH AND DEVELOPMENT*

Research with the design was directed toward investigation of specific problems. As has been mentioned, fabrication and test of full-size laminated frames was of paramount importance. These frames so cut that one such test section consisted of the bottom portion, a second test section encompassed that portion at the turn of the bilge and a third section included the upper portion of the frames. It is interesting to note that despite the rather severe curvature at the turn of the bilge, this section showed a modulus of rupture of 80% to 90% that of the straight sections. The average modulus of rupture for all three sections was 9500 p.s.i. for oak (13,900 for small clear laboratory specimens) and 9000 p.s.i. for Douglas fir (11,700 for laboratory specimens).

In order to evaluate or compare the relative strength of laminated and solid beams, one bending test specimen was made up of a laminated oak beam and a solid oak beam. The latter was carefully selected for straight grain and minimum number of defects. The laminated beam was tested at a moisture content of 7.7% and the solid beam at a moisture content of 34%. These moisture contents are representative of those normally expected of the two types of beams, the solid having been air seasoned for at least one year prior

**Much credit for the success of the recent AM421 design is due the numerous shipbuilders, naval architects, manufacturers of wood products and wood technologists that had active parts in the program. To select each by name and mention the direct contribution performed by him would in itself be a stupendous task. However, this acknowledgement of service rendered the wood shipbuilding industry would not be complete without special mention of those people who took active part in the early development of the design. These include, in addition to those mentioned in the text, A. E. Luders, Jr. who ably pioneered laminating of the oak frame, C. A. Rischell and N. V. Poletika of Timber Engineering Co. whose counsel and guidance contributed greatly to the success of the laminating program, Martin Weir, formerly of the Navy Department, whose able trouble-shooting helped the laminating program over rough spots in field development, C. D. Dosker of Gamble Bros., Inc., active in the laminated bending stock and finger scarfed planking programs, and Phillip L. Rhodes Co., design agents for the AM421 Class, who developed much of the detail design.**

to test. The results showed a modulus of rupture of 13200 for the laminated beam and 8400 p.s.i. for the solid.

Because little data on the strength of various types of knee assemblies was available five types of assemblies were developed and tested. The best from the standpoint of both ultimate strength and proportional limit was a laminated bosom knee bolted to the interior faces of the frame and beam. There followed, in order of merit, curved laminated cheek or gusset pieces glued and bolted to both side faces of the frame and beam; a cast silicon bronze bosom knee bolted to the interior faces; silicon bronze channel-shaped struts bolted to both side faces, and of least merit, flanged silicon bronze cheek or gusset plates bolted to the side faces of frame and beam.

A series of direct and lateral withdrawal tests of 6″ bronze lag screws in oak and Douglas fir yielded the information that the holding power in oak (3″ screw penetration) was equal to or greater than the strength of the fastening. The holding power in oak under conditions of direct withdrawal was 60% better than in Douglas fir and was 40% better for lateral withdrawal. Tests were also conducted to determine the holding power of the head in 2½″ Douglas fir planking. It was found that a 1¼″ washer under the head increased the holding power by 60%. Furthermore the holding power of the head plus washer in the planking was 60% of the holding power of the screw in oak but only slightly better than the holding power of the screw in Douglas fir.

Further experimentation and tests resulted in acceptance of such items as laminated oak bending stock; end scarfed and glued planking; and preservative treated glue-laminated woods. The laminated oak bending stock alone has cured many procurement headaches in the AMS program. Wood which in solid form is unsuitable for steam bending can be cut into strips, shuffled together and subsequently glue laminated into bending stock equal to or superior to solid stock of bending grade. Preservative treated laminating stock opens the door to complete decay resistance for large timbers. End scarfed and glued planking means utilization of short lengths to achieve planks of length only limited by handling facilities.

### *PRESERVATIVE AND PROTECTION*

Strength and durability are the two most desirable qualities in a structural material. Wood excels in its ability to carry load but it is generally deficient in decay resistance, especially in marine environments. This need not be a deterrent to its use however, for the natural decay resistance of wood, great or little as it may be, can be supplemented by the introduction of decay inhibiting chemicals into its cellular structure. In order to be fully effective the wood should be completely penetrated with the preservative, which for most species necessitates introduction of the solution by some pressure means. This in turn requires specialized equipment large enough to handle the largest timbers to be used. A much inferior way to partially preserve is to treat the surface to the maximum depth possible by means of surface application by brush, spray, or dip.

One of the oldest most effective preservatives is creosote oil. Millions of board feet of utility poles, fence post, railroad ties, foundation timbers, etc., have been successfully treated with the material. For several reasons creosote oil is unsuitable for preservation of ship timbers. It should not be used on interior portions of living spaces because of its objectionable odor; it cannot be used on timbers whose surfaces are to be painted, since standard oil paints will not readily adhere; its weight is excessive in comparison with other preservatives. Because of these limitations creosote oil was eliminated as a preservative for the minesweepers and instead, solutions containing copper or arsenic salts were used.

The minimum treatment specified


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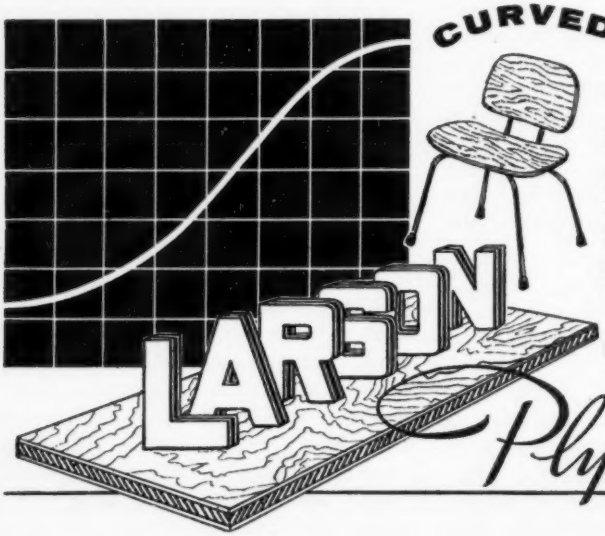


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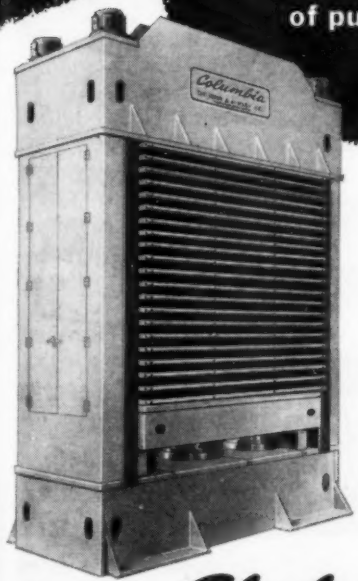


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was a heavy brush coat on all surfaces after all shaping had been done. Practical difficulties limit the use of pressure preservative treatment to relatively small boards. A cell structure such as in white oak or dense Douglas fir resists the penetration of the preservative to such extent that under the best of conditions protection is limited to less than 1″ depth. Therefore, large timbers would not be completely protected even if they could be pressure treated. Another practical deterrent to pressure treating of large timbers is the cost and labor of handling. The item to be treated must first be fabricated in the builder's yards, all rough cutting and shaping completed and then the item shipped to a treating plant. Furthermore, the cutting and shaping of the timbers must be to as near the finish dimension as possible to reduce the amount of treated wood necessarily cut away in the final finishings to shape. This practically necessitates fitting the timber into the vessels and then removing it for shipment and treatment, but this obviously is an impractical way to build wooden vessels.

Since pressure preservative treatment can be utilized to fully protect thin timbers, it was specified for all ¾″ stock including that to be protected against marine borers, and for all plywood. Thus the diagonal planking, hull sheathing, bulkhead planking and all plywood was ordered by the shipyard in treated condition. All other members were dip, or brush treated, the former being employed where possible. All cut and bored surfaces were liberally brushed or swabbed with preservative. This treatment, though incomplete


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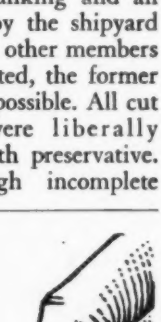

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from the standpoint of full preservation, should be of great benefit in prolonging the life of these vessels. Time only will be the measure of the success of the treating program.

### THE FUTURE

The new designs of the minesweeper program, although a significant advancement over anything of similar magnitude in the past century, are only a step in the possible progress of wood ship design. It is obvious that further refinements of wood structures are possible and probable. Development of new techniques for fastening, manufacture, and preserving of structural members will improve strength and reduce weight to the point when wood is in direct competition with steel. It is now a fact that most woods can be fully preservative treated in the form of small pieces and then glued together to form structures of complex shapes and large dimensions. Mechanical connectors have been developed that effectively enable a joint to transmit the load capability of the joined members. Vision and ingenuity will devise structural systems more suited to the properties of wood. Glue-laminating shows great promise in enabling selective combinations of wood such that the strength properties of each species is exploited to its fullest. Naval architects have an excellent construction material at their disposal and an introduction to efficient ways of using it. If they accept the challenge presented to them, eliminate inhibitions and outmoded structural concepts, design with imagination and vision, this "new" material will yield them many successful and advanced ship structures.

**This article was originally prepared for the Chesapeake Section of the Society of Naval Architects and Marine Engineers at the February, 1955 meeting. It is reprinted with permission.**

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# SPECIAL PLYWOODS And Their Utilizations

By James R. Fitzpatrick

*Director, Technical Ply-Woods Sales*

***To the average man on the street, the term "plywood" may mean wood in panel form which can be used in several ways. However, a look behind the scenes reveals that plywood is an all-inclusive term for many materials—using a basic construction principle, but manufactured for various uses. Educating the public to the versatility of wood is an important part of our editorial policy and, we believe, of the woodworking industry's responsibility. This month we are presenting a report from Technical Ply-Wood Sales, showing many adaptations of plywood.—Editor's note.***

TWO awards for unusual applications of Technical Ply-Wood Sales' material Fybr-Tech are recent accomplishments of which we are justly proud. This report will describe our various types of plywood and mention some of the many ways our products are used.

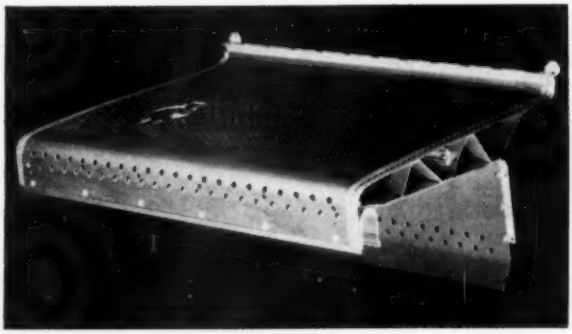
To begin with, the company is 17 years old. James R. Fitzpatrick and A. N. Carstens, deceased, organized the firm in 1938. Both of these men had been active in the development, manufacture and sale of plywood since World War I. Two of our products, Carstenite and Mesh-Tech, are covered by our patents.

Carstenite was one of the first products we produced. It is a panel consisting of one thin veneer face, 1/48″ and thinner, glued to a hardboard panel. It is furnished in large and small sizes —largest size being 48″x96″—and ⅛″, 3/16″ or ¼″ thick. On special orders it can be made thicker and longer. This material is easily planed, sanded, sawed, cemented or nailed. It can be mitered, embossed, routed and shaped with regular woodworking tools.

This panel is particularly popular for interior use in stores, theaters, schools and railroad cars. In the industrial field it has been used for table tops, displays, book covers, boxes, cabinets, card table tops and practically every other use to which plywood or wood finds application. Currently, architects on the West Coast are using quantities of it because it combines acoustical and decorative qualities in a material that serves well for insulating purposes.

## *FYBR-TECH*

We mentioned our awards at the beginning of this article. Both of the awards were in the transport field for applications of Fybr-Tech. This material has a wood veneer or plywood core with sheets of vulcanized fiber of various weights and thicknesses —.005″ to .020″—glued to both faces,



*Greyhound Fybr-Tech luggage rack, 30 to a coach.*

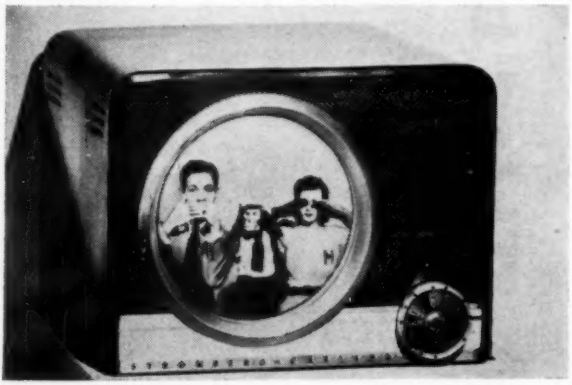
preferably by hot plate resin glue process. Fiber faces are tough, non-splintering and non-corrosive, resistant to cuts and scratches, and a good base for finishes. There are no face joints and the material can be made with a one-piece core if desired.

Fybr-Tech does not require sanding and can be finished with lacquer, varnish or paint without any special preparation. Thicknesses normally furnished are 1/16″, 3/32″ and ⅛″, all of which have a single ply veneer core. For thicknesses above ⅛″, a 3-ply panel of proper thickness is used. The maximum width and length is 48″ x 96″, although in special cases the length can be increased. A sheet of Fybr-Tech weighs less than half that of an aluminum sheet of comparative size and thickness.

Various tests have demonstrated that Fybr-Tech has unusual wearing qualities. One test showed that after 72 hours of abrasion with a cold steel roller washer at 1800 r.p.m., the thickness was reduced only .0014″. There was no reduction after the first 24 hours and it was thought that the initial reduction was probably the result of compression rather than friction.

For electrical uses, Fybr-Tech has dielectric strength of 300 volts per unit, minimum. Gasoline, turpentine, linseed oil, ammonia, alcohol, acetic acid and other acids do not affect it.

Recently Fybr-Tech was successfully



*Stromberg TV set with a Mesh-Tech face.*

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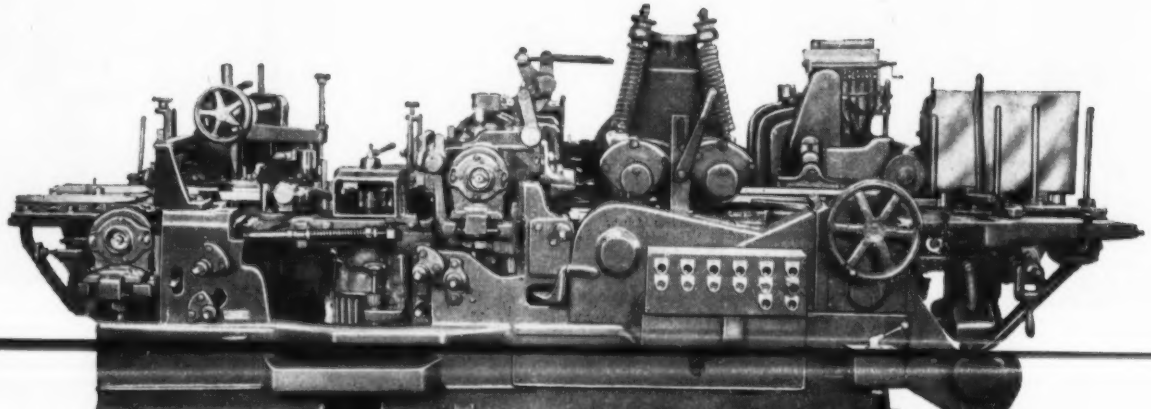

134 Woods Moulder, shown with hopper feeding attachment

## Production depends on DESIGN!

From the forest to the finished product, *Leaders in the Industry* depend upon Woods "Lag Bed" Moulders for quantity and quality production. Among such Leaders are—

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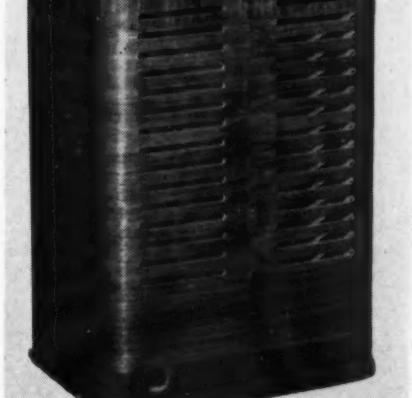
*Carstenite top on a Shaw-Walker desk.*

*Farnsworth - Capehart TV combination with lower doors of Mesh-Tech.*

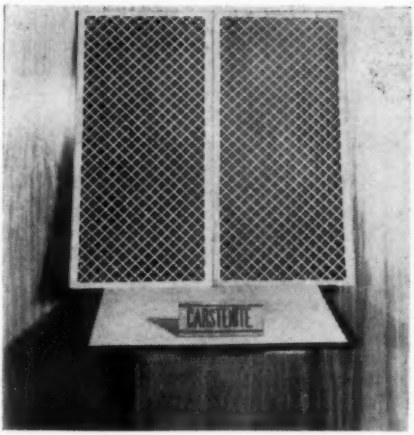
used in manufacture of an extremely light luggage rack for the Greyhound Bus Co. The material was selected at the request of a large automotive company which had found itself short of aluminum and was seeking a substitute. Fybr-Tech is lighter and stronger than aluminum for comparative sheet size. All of the bending, perforating, notching operations, etc., were done by Technical Ply-Woods, the customer merely attaching the aluminum brackets to the fabricated Fybr-Tech forms. Approximately 30 of these sections were used in each coach. Greyhound used this type of luggage rack in approximately 3500 coaches.

For this application, Technical Ply-Woods received an honorable mention in the annual competition for industrial design which is sponsored by the magazine "Modern Plastics."

The following year a first place blue ribbon award in the "Modern



*Carrier humidifier made with Carstenite.*




*Grill and perforated panels of Carstenite.*

Plastics" competition was given to us for a lightweight modified Fybr-Tech panel designed for the interior of some trans-Atlantic flying boats.

In describing the panel, "Modern Plastics" said: "A remarkably lightweight interior cabin paneling made of a fiber-plywood combination, laminated with phenolic resin adhesive which has gained considerable favor in the aircraft field, is being used for trans-Atlantic flying boats of the VS-44-A type built for American Export Airlines by the Sikorsky Aircraft Company."

Fybr-Tech has other uses in the transportation field. The Goodyear Company is using it in manufacture of dirigibles. ACF-Brill finds that Fybr-Tech is excellent for bus linings and interiors. It can be used practically every place where sheet fiber is now used.

### *HOLLO-TECH*

Another form of Fybr-Tech is Hollo-Tech. This panel consists of top and bottom faces of Fybr-Tech or thin

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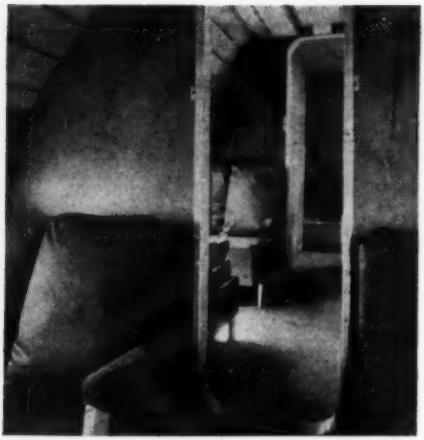

*Interior American Export flying boat. All interior panels shown are Fybr-Tech weighing 1/5 lb. per sq. ft.*

plywood and a core made up of beam members in a cubicle of ladder design. Hollo-Tech had been used for doors, partitions and lightweight flooring, but it found a particular use during the latter part of World War II. At that time we were asked by the Budd Company of Philadelphia to develop a panel for the Navy that would be 4′ wide, 25′ long, to carry a load of 500 lbs. per sq. ft. Deflection was not to be more than ¼″ in the 18½″ span, and not to exceed ¾″ thickness. The weight was not to exceed 1 lb. per sq. ft.

Our firm developed a panel that exceeded these requirements. It weighed .9 lb. per sq. ft.; carried a load of 800 lbs. per sq. ft. and showed a deflection of only 3/16″. In order to make this panel, we set up a woodworking plant in a rubber factory near Philadelphia. We used a large belt press 4′ x 25′ and thus were able to furnish a panel full size as required.


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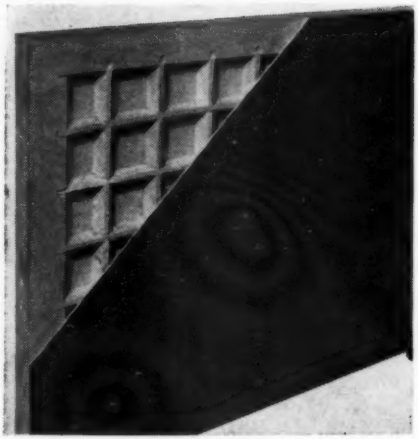

*Section of Hollo-Tech floor used on Budd Navy Cargo plane.*

Construction was that of a hollow core of egg crate design faced with Fybr-Tech 3/32" thick.

### MESH-TECH

Recently we have developed a new type of panel called Mesh-Tech. This material is being used in radio, television, decorative and acoustical fields. The panel consists of two thin layers of veneer, not exceeding 1/48" in thickness, and a plastic core. It is perforated in any combination of diameter holes and centers for which dies are obtainable.

Mesh-Tech lends itself to the construction of radio and TV cabinets because it fits well into the general design of the cabinet. The same figure in the cabinet is used.

### METL-TECH

Another type of luggage rack is also being used by the Greyhound Bus Company. This rack consists of a plywood core and aluminum faces and is called Metl-Tech. Two sections of the rack are made in compound curvature. The aluminum is .020" thick and the 3-ply core approximately 3/16".

Metl-Tech can also be furnished with rust resistant steel faces, stainless steel or copper.

Our firm has concentrated on developing special types of plywood rather than the all-wood plywood panel. Our standard plywood is called Ply-Tech. All of the products mentioned here are of the plywood family and are manufactured exactly the same as plywood, either by hot or cold process. The one exception is Metl-Tech which is usually made with the cold press process.

Technical Ply-Woods, now known as Technical Ply-Wood Sales, has two affiliates—Carstenite Sales and Recreation Sales. Our firm has been located at 228 N. LaSalle St., Chicago, since its organization.


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# HARDWOOD DIMENSION STOCK MAY BE THE ANSWER

By

J. Edgar Kennedy

*Managing Director, H.D.M.A.*

ARE you knocking yourself out operating a dual purpose business, that is, the refining of a basic raw material and the design, assembly and merchandising of a finished product? If you are, the dimension parts industry may have some answers to your cost and production problems.

During this highly competitive era in our economic history, it behooves all of us to leave no stone unturned in our efforts (1) to know at all times the exact cost of producing our product, and (2) to always be on the alert for new ways to cut these costs.

Not only is it necessary for furniture manufacturers to compete with one another, it is even more important that you band together as an industry in your bid for a larger share of the expendible consumer dollar. In this bid you must compete with such formidable foes as the automotive, television and home appliance industries, to mention only a few.

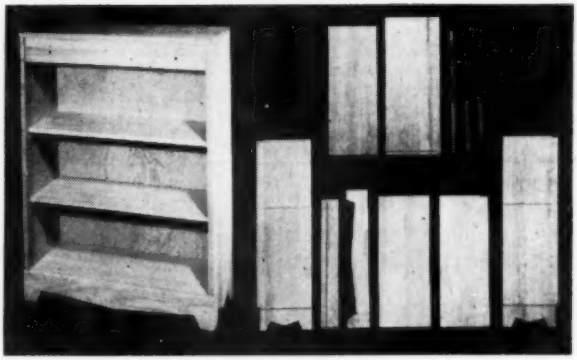
## *WAYS TO CUT COSTS*

When we begin to look for ways to cut our costs, we may look first at the cost of our raw materials, or the labor which is required to process these raw materials into a finished product. In furniture manufacturing, both raw materials and labor are formidable elements of cost. Cost studies which have been conducted by the furniture industry over a period of years indicate that materials used (mainly lumber) amount to from 45% to 50%. Factory payroll amounts, on the other hand, to 25% of the sales dollar.

Since lumber constitutes the largest portion of the materials used by a furniture manufacturer, presumably we should look first for ways to cut the cost of making available the component wood parts which go into the product.

Importing rough air-dried lumber means paying very high freight rates not only on the 50% to 60% usable material, but also on added weight resulting from excessive moisture content. Consider, for example, the average weight of air dried 4/4" oak, which is 4200 pounds per thousand feet. When reduced to kiln dried rough dimension (moisture and defects removed) the weight is reduced to 2730 pounds per thousand feet. When semi-machined to ¾" finished thickness, the weight is further reduced to 2048 pounds per thousand feet, considerably less than one half the shipping weight in its original rough air-dried form.

Labor costs are another matter worth considering. If your plant is in a highly



*Oak bookcase completed and dimension stock required for assembly.*

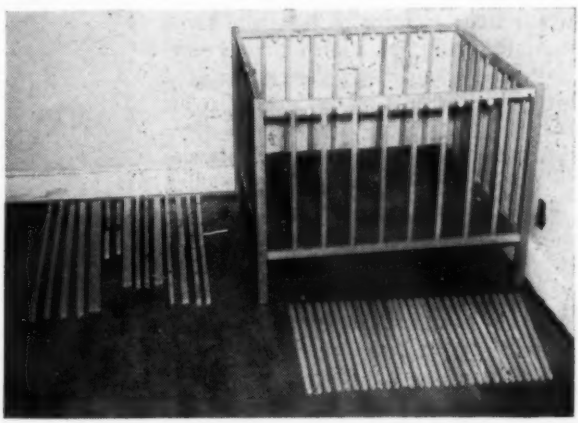
industrialized area, you must compete with other industries for labor. It is reasonable to assume that the average factory labor rate here is considerably higher than it is for the furniture or dimension plant which is usually located in less industrialized areas.

The savings in transportation and labor costs are but two of many ways that costs can be reduced.

## CONTROL INVENTORY

The average furniture manufacturer, producing his own dimension, finds it necessary to carry an inventory of lumber of from three to four months' consumption in all the species used. With such a large inventory, fluctuation in the market price of lumber could result in a serious loss. In any event, several thousands of dollars of working capital can be tied up in lumber inventory for a long time. By turning to the dimension stock manufacturer for wood parts, these hazards can be avoided and an adequate supply of materials assured.

An inventory of prefabricated wood parts eliminates the hazards involved in the handling of rough lumber, such as degrade through checking, splitting, warping and staining. Purchased wood parts are almost 100% usable, and re-



*Playpens can quickly be assembled with dimension stock.*

*Contact the Hardwood Dimension Manufacturers Association, 218 Broadway Nat'l. Bank Bldg., Nashville 3, Tenn., for additional information. The association can furnish you with the names of dimension manufacturers in your own area.*

sult in quick turnover, thus increasing working capital and reducing interest and other charges.

An important factor in "purchased" wood parts is the known raw material cost. To meet the competitive situation which exists today, it is essential that we have an accurate record of our costs. To my personal knowledge, many furniture manufacturers do not maintain a cost system which will accurately reflect their costs. By dealing with a reliable dimension parts manufacturer, a definite raw material cost can be established, thus permitting a selling price for the finished product with complete assurance that costs are predetermined accurately.

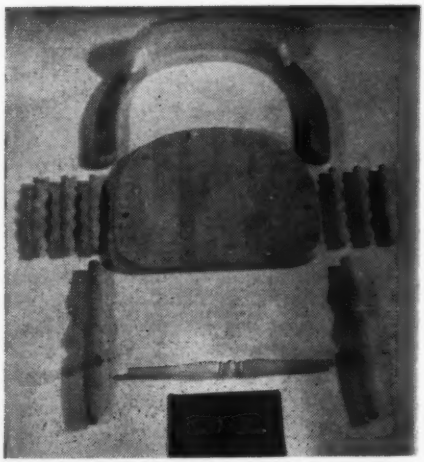
## REDUCES OVERHEAD

The purchase of kiln dried prefabricated wood parts permits the furniture manufacturer to eliminate some manufacturing operations. This is especially important where the user is faced with the problem of congestion in his factory. The release of valuable floor space for assembly and storage provides increased turnover in working capital. The operation of dry kilns and the maintenance of lumber yards and storage houses requires a greater amount of space.

The use of purchased prefabricated wood parts will reduce overhead without a reduction in sales volume. Reduction in raw material inventory will cut the cost of inspection, supervision, maintenance and other indirect yarding expenses. Administrative expenses will also be reduced. Officers, sales executives and research technicians can devote more time to the improvement of designs of the finished product, to marketing, and to improved efficiency in assembly and finish of the product.

## PROBLEMS OF WASTE SIMPLIFIED

Since properly manufactured wood parts are accurately cut to size, waste at the plant of the fabricator is negligible. Accordingly his waste disposal problems are eliminated.



*Here are some of the pieces required for manufacture of captain's chair.*

*Completely machined wood parts, some of many available from dimension stock manufacturers.*

"Purchased" wood parts eliminate for the consumer the problems relating to utility or yield of lumber. It is of the utmost importance that the true lumber costs, above all other elements of cost, be accurately predetermined in the preparation of cost estimates. This factor alone represents the major element in the total cost of producing a given item of furniture.

Well established dimension parts manufacturers know the importance of the selection of the proper lumber grade and the accurate forecast of utility in the processing of wood parts. To the furniture manufacturer, known lumber costs are provided when he purchases pre-cut items. He is relieved of all of the problems relating to raw material, storage and fabrication.

To meet the needs of the ever increasing demand for prefabricated wood parts, members of the Hardwood Dimension Manufacturers Association have kept stride, and in many instances a step ahead, of the parade of progress in the woodworking field. The hardwood dimension plant is equipped with up-to-date dry kilns and conditioning rooms, together with large dry storage buildings in which to store large quantities of kiln dried lumber in different grades and species, ready to be prefabricated into any part required by the customer.

When dealing with a member of H.D.M.A., you have the assurance of receiving a "Certificate of Origin" which accompanies his invoice and which guarantees the quality of the wood parts covered by the order. Therefore, when placing an order for wood parts, insist that the producer furnish you a "Certificate of Origin" with his invoice.

The dimension manufacturer is a specialist and can furnish parts better and cheaper than you can make them yourself. You might do well to explore the many advantages enjoyed by the dimension producer. We believe that you will be convinced that he can supply your wood parts either semi-fabricated or completely machined more efficiently and at a lower cost to you.

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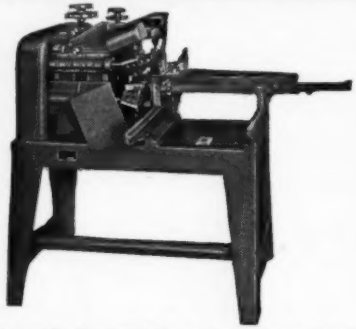

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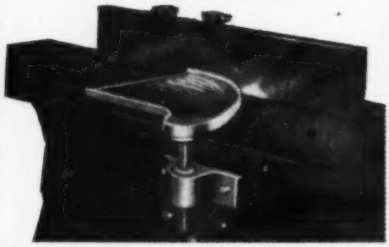

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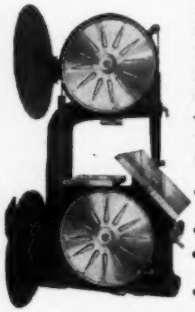
## FAY EGAN



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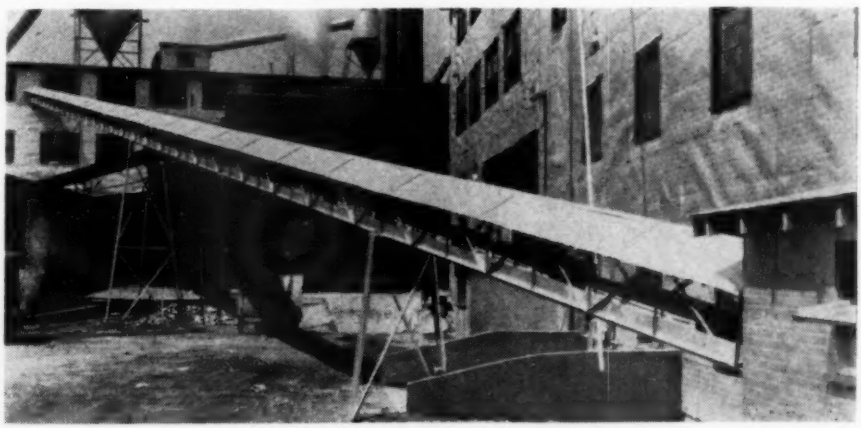
# UNITED FURNITURE CORPORATION EXPANDS PRODUCTION FACILITIES

Important things are happening these days at United Furniture Corporation, Lexington, N.C. For one, the firm plans to produce dining room furniture in 1956 . . . and thereby hangs a tale. As furniture retailers know, United makes good bedroom furniture and enjoys a fine reputation from coast to coast. The "tale" has to do with how the Philpott brothers, whose father started the business in 1922, have made good equipment work for them.

Cloyd Philpott, the elder brother who heads the concern, puts it very simply: "We don't buy any piece of equipment unless we are sure it will pay for itself in a reasonable time." You can see how a philosophy like that, scrupulously carried out, would permit a woodworking plant to offer excellent values to its customers.

United was founded in 1922, by the late B. C. Philpott. Four of his five sons are active in the firm: Cloyd, president; Robert, secretary-treasurer; Alvin and Hubert, vice-presidents. The fifth son, Harry, is dean of religion at famed Stevens College, Missouri.

United Furniture Corp. now has 450 employees, and expects to add 250 more when the new plant swings into production. But for right now, the building program comes first.



*The 230' conveyor at United which runs from the basement skid-making room, up three floors to the cabinet room. This arrangement alleviates a bottleneck in getting skids to the cabinet room without tie-ups of valuable space and elevators.*

FIELD
SINCE 18--

CHAIN MORTISE
CUTTING EQUIPMENT

A TOOL ROOM Product
By A Tool Room Expert!

Use our double bearing guide bars for flat bottom mortises. The riveted plate and bearing construction provides the utmost in strength and interchangeability. More than 90 standard and many special sizes of cutting equipment in stock. We are well-equipped to furnish special sizes like the above bar in many widths and lengths.

Write for complete information on our chain mortising equipment.

WILLIAM H. FIELD CO.
327 Dorchester Ave. Boston 27, Mass.

The Philpotts are expanding the present bedroom furniture plant, to take care of increased demand. They have also bought the vacated building of a defunct cotton mill which is being converted, from the ground up, into a very modern plant to specialize in dining room funiture. When that goes into operation they will be showing the expanded lines in the present showrooms at New York, Chicago, Los Angeles, High Point and Lexington.

It is impossible to cover all of the production methods at United, but we can describe and illustrate the skid making operation. As this is a common denominator in most furniture plants, it should be illuminating.

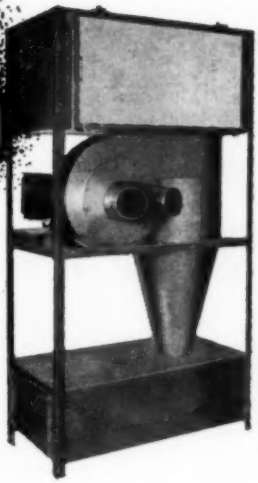
United goods are carried through the plant on skids—almost built on them—so the flow of these tells much concerning the flow of production. The story, then, starts in the basement of Plant No. 1, where a man and an Auto-Nailer keep the skids coming.

When he has put together five of

*Andrew Robertson is nailing strips to drawer fronts with a Spartan-4 Auto Nailer.*

# EFFICIENT–LOW COST

## Dust Collection



Easy installation . . . efficient low-cost operation . . . simplified maintenance, make Dustkop *FIRST* among equipment to collect most all industrial dusts. There are Dustkop models to eliminate your dust problems . . . that are space saving, self-contained units, or exhaust type for rafter, ceiling or outside location. Write for descriptive literature.

DUSTKOP® STOPS DUST

37 STANDARD MODELS TO CHOOSE FROM

• READY TO USE

***Also a Complete Line of Mist Collectors***

**AGET MANUFACTURING COMPANY**

1392 E. CHURCH ST. • ADRIAN, MICHIGAN


them, the operator stacks them on a conveyor, which travels outside the building, but under its own weather protection, to the top floor. Here there is a check-switch which halts the conveyor until the top-most stack has been removed—and which then permits the next stack of five to move into place.

The Auto-Nailer, as its name implies, makes and drives nails automatically, three a second. Replacing hand-nailing, it does in seconds what took minutes to do. For example, skids that used to take four minutes each, now come through in forty-five seconds.

The United skids vary, of course, with the piece of furniture for which they are intended. Without need for jigs, this variation is handled on the

**The SCREWDRIVER that knows its own STRENGTH**

Model 1435

Mall

This highly maneuverable, lightweight production booster features an adjustable "slip clutch" that lets you give predetermined sets to each screw driven. Included in this feature-packed tool are – powerful universal motor, balanced armature, heavy duty ball bearings, durable aluminum alloy housing. Drives No. 4 flat to No. 16 round head screws. Precision-built throughout . . . it's a real value at **$72.00.**

**MAIL THIS COUPON NOW**

**MALL TOOL CO.** PORTABLE POWER TOOLS GASOLINE • ELECTRIC • AIR

7784 South Chicago Ave., Chicago 19, Illinois

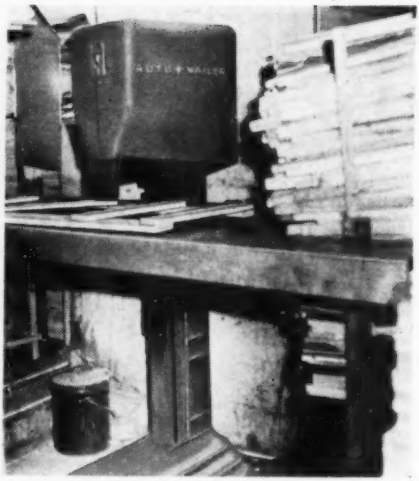
Send me more information about MALL tools for the woodworking industry.

*Name* _____

*Company* _____

*Address* _____

WU-174

*Close-up of a Spartan-4 Auto Nailer. The machine makes dresser skids of 3/4" x 2 1/2" stock.*

machine without adjustment. But in other work through the plant, where jigs are required, the Auto-Nailer fits just as exactly into the pattern of the work.

All Auto-Nailers cut their nails from a reel of knurled wire, the length of nail being instantly adjustable by the simple turn of a calibrated dial. The machines will cut blunt, needle-point or headed nails; will clinch, brad, countersink or start the nails for later hand-driving.

Moving the furniture through the plant on skids, as described here, has done a great deal to improve efficiency at United. It is this type of planning and the progressive attitude of using the best possible machinery that has made possible the further expansion program for the company.

Our best wishes and congratulations to the Philpott brothers as the old Barbet Cotton Mill becomes a new plant for the United Furniture Corporation.

# Around THE SHOP

## PRESS HOLDS VENEER FOR STRAPPING

Units of veneer produced at Oregon-Washington Plywood Co., Brookings Division, Harbor, Ore., are compressed in a shop-built press for strapping before shipment. The operation is quickly done and results in easier handling, less damage to veneer in shipment and less space required for storage and shipment.

The press is made of steel I-beams and an 8-inch air cylinder. The base has five I-beams at floor level. The veneer units are brought from the sorting table by lift truck and placed on 2 x 4's on top of the beams.

A steel frame above the veneer unit is raised or lowered by the air cylinder, which is anchored to the central beam in the base. A vertical beam at the back of the frame and base serves as a fulcrum. When the veneer is compressed, Signode ⅝-inch steel strapping is placed around each end of the unit. About 1800 square feet of veneer are put in one unit.

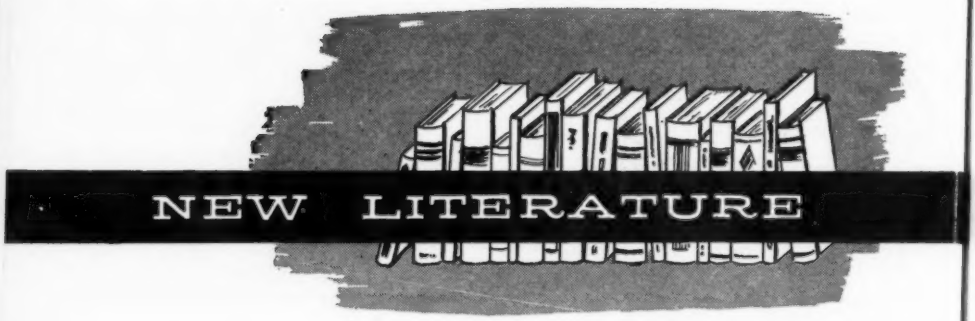
## PROTECTION FOR FLITCHES

An interesting innovation at the local veneer manufacturing plant of Chester B. Stern, Inc., is the use of polyethylene film plastic for the protection of flitches while they are being stored before being cut into veneer. The accompanying photograph shows the use of this film in protecting a stack of Idaho knotty white pine flitches.

Discussing this innovation, R. K. Stem says:

*Veneer flitches protected with plastic film.*

"We like to keep a supply of flitches in storage in order to be able to cut veneers to the various thicknesses which our customers require. In the past we have found that if the flitches are not protected in some way they check severely on the sides in a few days. We are finding that this definitely is avoided by the use of this plastic protection. The plastic material is very tough, and it is not too expensive to be used to cover our lumber piles after they come out of the kiln, in the event they must be left outdoors through some emergency. We also use this plastic to protect our piles of pine crating, to keep them from getting wet and turning black."




## CLAMP CATALOG

The Hartford Clamp Company, 466 Park Ave., E. Hartford, Conn. has issued a catalog which does a very fine job of completely covering its line of clamps. This company has been producing quality clamps for the woodworking industry for more than 40 years. The particular features incorporated in all of the clamps are listed early in the catalog.

One section is given over to deep engagement clamps—with quick action and deep reach. The next section concerns bar clamps. These are illustrated and complete specifications given. Other sections deal with spring clamps, clamp fixtures, double bar clamps, hand screws, edge clamp attachments, universal clamps and mitre clamps.

Hartford clamps are used in countless ways. The last page of the catalog furnishes illustrations of some of the uses and lists many of the firm's satisfied cusomers.

## STEEL STRAPPING BOOKLET

United States Steel's Gerrard Steel Strapping Division offers a brochure illustrating their models TA and TE steel strapping machines. This equipment is particularly useful in strapping light parcel post and express packages weighing up to 75 lb.

Free copies are available. Requests should be directed to: Gerrard Steel Strapping Division, United States Steel Corporation, 2915 West 47th Street, Chicago 32.

## WHELAND TRIMMER

The Wheland Company, Signal Mt. Rd., Chattanooga, Tenn., has issued a new bulletin about its ball and roller bearing automatic drop saw trimmer. It is designated as Bulletin No. DT-2. This booklet illustrates the machine and describes its construction.

The last page of the folder lists complete specifications. This is a well built piece of equipment which can be used for sawmill service or in the planing mill.

## SAW AND JOINTER GUARDS

The D & M Guard Co., 897 Military Rd., Buffalo, N.Y., has a four-page folder available. This leaflet illustrates several automatic saw guards for both heavy and light work. The guards are used table saws.

Flohr automatic jointer guards are also illustrated and described. The company also offers guards for band saws and for shapers. Descriptions are very complete and each type of guard is illustrated.

## BULLETINS ON DUST COLLECTION

Two new and revised catalogs covering the entire line of Dustkop, industrial dust collecting equipment, and Mistkop, industrial vapor collecting equipment, are available from Aget Manufacturing Company, Adrian, Michigan. Bulletin

No. 636-3 offers valuable and practical engineering information on Dustkop industrial dust control, its installation, operation and maintenance. It also features a wide range of Dustkop models for most every application requirement.

Bulletin No. 622-3 offers the same technical and practical information on Aget's Mistkop line of industrial vapor collectors. Aget Manufacturing Company, one of the nations leading manufacturers of dust and vapor collecting equipment, produces over 40 models to collect, economically, almost every type of industrial dirt, dust, sawdust, lint, shavings, mist, fog or vapor.

## CLAMP CATALOG

The Wetzler Clamp Company, 43-15 11th Street, Long Island City 1, New York, announces that an attractive, handy 20-page catalog is now available free. It describes and illustrates a

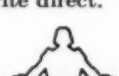

**What a difference a coat makes!**

**Any smooth-surface Presdwood product now available in Primecote!**

Now! Another advantage for users of Masonite Presdwood panels. No need to prime or seal. Save time and cost of first coat.

A special Masonite process lays down a hard, tough first coat on *any* smooth-surface Presdwood® panel. A superlative base for wood graining, decalcomania, silk-screening, paint, lacquer or enamel. Makes possible better, longer-lasting finishes to enhance product appeal.

*Get the details now!* Our engineers are ready to help you. Send coupon or write direct.

Look for this man  He makes the difference

**MASONITE® CORPORATION**

**Dept. WWD-12, Box 777, Chicago 90, Ill.**

Please see that I get full information about Primecote Presdwood panels.

*Name*.....

*Firm*.....

*Address*.....

*Town*.....*Zone*.....

*County*.....*State*.....

wide assortment of clamps and clamping devices specially geared to meet the exacting requirements of the woodworking, cabinet making, furniture and allied industries.

**BOICE-CRANE CATALOG**

A new 51-page catalog on power tools for cutting, shaping, drilling and finishing wood, metal, fibre and plastics, has just been produced by Boice-Crane Company.

Illustrated and fully described are jointers, planers, band saws, contour saws, drill presses, band filers and grinders, jig saws, lathes, belt sanders, spindle sanders, shapers, tilt arbor saws, and saw jointers.

A copy of this new catalog will be sent free to anyone addressing Boice-Crane Company, 931 Central Avenue, Toledo 6, Ohio.

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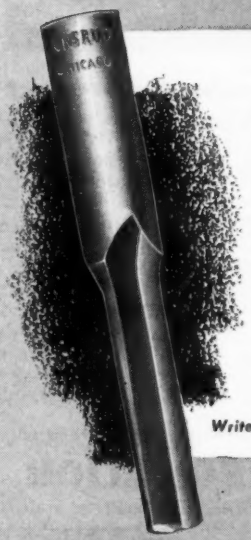
A bore is a person who talks when you want to.


CUTTING PERFORMANCE

2 to 3 TIMES GREATER



The Special alloy high speed steel in Onsrud bits makes possible a finer, more serviceable cutter for smoothest work. The bits are carefully ground to correct clearance, tempered in modern controlled atmosphere electric furnaces, to insure uniformity and accuracy. These bits can usually be relied upon to give from 2 to 3 times the cutting performance of most ordinary routing bits because of their high tensile and transversal strength.

*Write for illustrated BULLETIN and PRICES.*

Onsrud Cutter Manufacturing Co.

801-21 E. Broadway,

Libertyville, Ill.

## WOOD PRESERVATION

The sixth of the series of "Architects Bulletins" published by the Southern Pine Association is devoted to wood preservative and fire retardant treatments. Advice is given on conditions under which preservatives should be used and the type that should be used in each instance.

"When lumber is used under continuously dry conditions and is adequately protected from attack by insects, it is a permanent material and preservative treatment is unnecessary. There are uses, however, as in the case of window sash and exterior siding, where the wood is generally dry, but may be exposed to moisture for only a limited time at infrequent intervals. Usually painting alone cannot be relied on to prevent wetting of exterior woodwork. Wide roof overhangs, gutters and downspouts, and other good building practices lessen moisture troubles in walls. Added protection against the effects of moisture

**SOUTHERN HANGER BOLT**

Whether it be an unusually strong joint need, a routine requirement, or a complicated "free form" design that calls for extra strength at points of difficult angles — there's a Southern Hanger Bolt — in the correct size and strength for easier, sturdier, more economical construction. Precision made for finest tolerances. Available in Steel, Brass, plain or plated.

Write for free samples and stock list.
Box 1360-D

Warehouses:
New York
Chicago
Los Angeles
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Southern
SCREW COMPANY
STATESVILLE - NORTH CAROLINA

is afforded by non-pressure treatments."

"Brush, brief dip and light vacuum processes with water repellent preservatives are used for these less severe exposure conditions."

The bulletin discusses pressure treating methods in connection with more severe conditions of exposure.

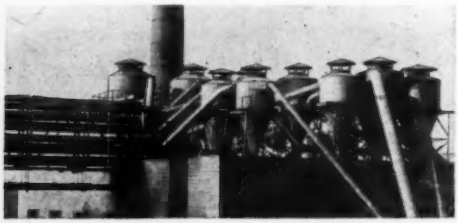
Copies are available from the Southern Pine Association, P. O. Box 1170, New Orleans, La.

## NOVEMBER 1955 RED BOOK

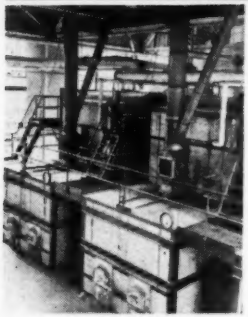
The November 1955 issue of the "Lumbermen's Red Book" is just off the press. It is the 148th issue of the famous credit and sales guide.

Since 1876, the book has been the principal source of credit information for the lumber, woodworking and allied industries of the United States. It lists —and evaluates—the manufacturers, wholesalers, retailers and quantity users of lumber and wood products


Free Fuel WITH AN



OBP BLOW PIPE SYSTEM



Bottom photo shows discharge piping to boilers. Top photo shows cyclone type units used to collect and distribute material.

A large woodworking plant in Ohio uses a custom engineered OBP pneumatic system to convey their chips, shavings and dust to the furnaces for additional fuel. Not only is this extra fuel free, but the efficient OBP system keeps the entire plant continuously and automatically free of dust, chips and refuse.

This plant has more working area, better working conditions and greater production. They have clean air to breathe, reduced fire hazards, and have eliminated the cost and clutter of boxes, trucks and manpower necessary for manual scrap removal.

An OBP engineer is at your disposal! Call him today! Systems are surprisingly low in initial cost, are virtually maintenance-free, and can actually pay for themselves in a short time.

We handle the complete job —
ENGINEERING—MANUFACTURING—INSTALLING

OHIO BLOW PIPE CO.

1717 Doan Avenue • Cleveland 15, Ohio • MU. 1-7379

of all kinds. The listings include credit ratings, business classifications, addresses and other facts of value to buyers and sellers alike.

The Red Book is published by the Lumbermen's Credit Association Inc. Its headquarters are located at 608 South Dearborn Street, Chicago 5, Illinois, and an Eastern branch is maintained at 99 Wall Street, New York 5, New York. Inquiries to either office will receive prompt attention.

**THREE "CORKERS"**

Three new products, of interest to persons concerned with dry kiln operation and maintenance, are announced in a new descriptive folder titled "3 Corkers." The new products are the "Uni-Seal" kiln door gasket, "Uni-Seal" rubber-to-steel cement, and "Uni-Coat" rust preventive coating.

The new gasket and cement are described as offering a door seal with greatly extended service life and free-

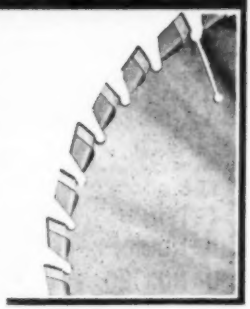

**HELP WANTED:** Carbide Tipped Saw Blade to work three shifts in Production Shop. **MUST BE EXPERIENCED.**

**A. W. FORREST MFG. CO., Inc.**

If you are interested (and you probably are), in a Carbide Tipped Saw Blade with **"experience"**, consider what you really mean. In all probability what you are looking for is a blade that can be installed on YOUR particular machine . . . a blade that will do the job YOU want it to do, **"Without Compromise"**.

Forrest Blades are backed by years of **DESIGN EXPERIENCE** . . . years of manufacturing and designing **custom blades** for special applications and installations.

Information regarding the hundreds of special designs may be had by simply filling in the coupon below. No obligation, of course.



*MAIL TO:* A. W. FORREST MFG. CO., INC.
158 State Highway 17 Rutherford, New Jersey

BROCHURE AND JOB SPECIFICATION ANALYSIS FORM

*Firm* _____

*Att. of* _____

*Street* _____

*City* _____ *State* _____

*Type of machine* _____

*Material to Cut* _____ *thickness* _____

*Required Dia.* _____

*Used for: Ripping* ☐ *Crosscut* ☐ *Mitering* ☐

*Other* _____

**FORREST BLADES — OFTEN COPIED BUT NEVER DUPLICATED.**

NEW! IMPROVED STIX

FOR CEMENTING

- CONSOWELD
- FORMICA
- RESILYTE
- FORMICA
- TEXTOLITE
- PANELYTE
- LAMINEER
- V-BOARD
- PARAPLEX
- PLASTILITE
- FARLITE

...THE ONLY CEMENT WITH THE LONGTIME SHELF LIFE GUARANTEE

NEW STIX Does Not Thicken With Age. STIX Needs No Clamps, Process or Heat.

ADHESIVE PRODUCTS CORP.
1660 BOONE AVE. NEW YORK 60, N.Y.

FOR CUTTING HAND-HOLES IN BOX BOARDS

SUPREME HAND-HOLE BORER

This compact machine is built to give a lifetime of dependable service. It is manually fed and will provide neat, clean work. Adjustable stops regulate the length of the hand-hole, with the desired curve easily obtained by oscillating the bracket by hand. With a stop collar and special type cutter, even blind hand-holes are made with precision. For high speed production, also available in fully automatic model, which can complete up to 600 hand-holes an hour. Write today for illustrated literature.

SUPREME WOODWORKING MACHINERY CORP.
50-52 Howard St. New York 13, N.Y.

dom from trouble. The coating material is recommended as a practical medium of protection for structural steel and steel equipment against corrosion due to water, steam, and most corrosive chemicals. The folder covers all three products in detail, including prices.

Ask for "the 3 Corkers," from Universal Door Carrier, Inc., 1117 Cornell Avenue, Indianapolis 2, Indiana.

## V-BELT DRIVES MANUAL

The Multiple V-Belt Drive & Mechanical Power Transmission Association and the Rubber Manufacturers' Association, Inc., has announced the completion and issuance of their twenty-four (24) page completely revised manual of recommended "Engineering Standards Multiple V-Belt Drives."

The first edition of this standard was issued in 1951. Technological improvements in V-Belts have resulted in greater belt strength with attendant higher horsepower ratings. These have prompted the technical committees of both associations to revise their standards.

Basic changes in the revised manual include ten (10) pages of new horsepower ratings. These in general give increased ratings for standard quality belts throughout the generally accepted speed range; and also for the first time ratings on premium quality belts are included. The new manual shows ratings for belt speeds from 200 to 6,000 feet per minute.

Copies of the revised manual may be ordered from either the Rubber Manufacturers' Association, Inc., 444 Madison Avenue, New York 22, N.Y., or from the Multiple V-Belt Drive & Mechanical Power Transmission Association, 27 East Monroe Street, Chicago 3, Illinois.

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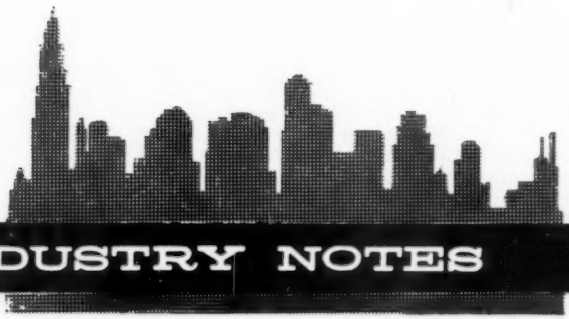
A cold is both positive and negative; sometimes the eyes have it and sometimes, the nose.



# INDUSTRY NOTES

## KITCHEN CABINET MEETING

The National Institute of Wood Kitchen Cabinets will meet in Chicago, January 23, at the Sheraton Hotel, it was announced by Fred F. Montiegel, manager. The Board of Directors will meet in the morning, and the full membership will meet at 2 p.m. in the afternoon. It will be the first full meeting of the group since its formal inception, October 1, 1955.

## HARDBOARD ASSOCIATION HOLDS MEETING

The Hardboard Association held its fourth annual meeting, recently in Chicago.

"Although hardboard is used for more than a thousand different purposes, we need to develop still more uses, and we feel an intensive educational program conducted by the Association will help achieve that objective," K. V. Hafner, newly elected president, said. Hafner is vice-president of Superwood Corp., Duluth, Minn.

Chapman Manufacturing Co.; Coos Bay Lumber Co.; Forest Fiber Products Co.; Edw. Hines Lumber Co.; Masonite Corp.; Superwood Corp.; U.S. Gypsum Co.; Weyerhaeuser Timber Co. are members of the Association.

Coos Bay Lumber Co., Weyerhaeuser Timber Co., and Edw. Hines Lumber Co. (having recently purchased Oregon Lumber Co. production facilities in Dee, Ore.) became members of the Hardboard Association at this meeting.

Newly elected officers include K. V. Hafner, president; A. J. Watt, general merchandise manager, U.S. Gypsum, vice-president; Paul Shoemaker, vice-president-sales, Masonite Corp., treasurer; Arthur VanderSys, president, Chapman Manufacturing Co., secretary, and R. S. Spangler, assistant to vice president-sales, Masonite, assistant secretary.

Headquarters of the Hardboard Association are 205 West Wacker, Chicago. Executive secretary is Donald Linville.

## WOOD GLUING SHORT COURSE

A short course in wood gluing will be offered by the State University of New York College of Forestry in Syracuse, January 23-28, 1956.

"In order to meet competition and at the same time provide a strong durable bond for the expected service of the product, consideration must be given not only to the proper selection of the adhesive, but also to the gluing technique, which is essential to quality control," says Professor Alfred H. Bishop of the Utilization Department, who will be in charge of instruction.

The course will include the structure and properties of wood, selection and machining of wood, principles of gluing, wood adhesives and their characteristics, assembly gluing, cold and hot pressing technique, radio frequency heating, testing of bond strength, quality control in gluing, and gluing defects and their causes. Lectures

will also be given covering drying, staining, and decay of veneer and plywood.

Early registration is desirable as course is limited to about ten people to provide for individual attention. For further information write Wood Gluing Short Course, Forest Utilization Department, State University of New York College of Forestry, Syracuse 10, New York.

## PLANT MAINTENANCE AND ENGINEERING SHOW

The Plant Maintenance & Engineering Show, one of the largest annual industrial expositions in the country, will return to Philadelphia for the 1956 event, January 23-26.

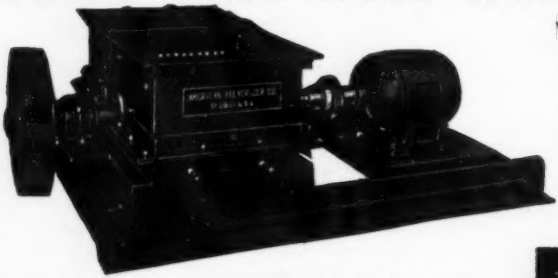
Now in its seventh year, the show annually attracts more than 20,000 of the nation's industrial executives who are charged with the upkeep of factories and machines.

At the same time, the 7th Plant Maintenance & Engineering Conference also will be presented. This conference, the largest industrial conference in the country, attracts about 2,500 engineers each year.

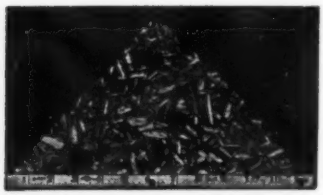
## RECORD ATTENDANCE AT A.W.I. CONVENTION

The Architectural Woodwork Institute, the young and growing trade association of the Special Millwork Industry held its Third Annual Convention at the LaSalle Hotel in Chicago during October. Attended by nearly 300 industry members and their suppliers, the meeting was deemed an outstanding success. All sessions were devoted entirely to assembly discussions under chairmanship of separate moderators for each subject and those in attendance participated freely in expressing their views on the many problems that the industry is facing.


**SHRED YOUR WOOD WASTE FOR FUEL with AMERICAN WOOD HOGS**



Make your wood waste pay as a cheap source of fuel—by reducing it to uniform shreddings in a quick, efficient one-step operation.



American's Wood Hog features lead in performance and low operating cost:

- Rugged Shredding Elements
- Adjustable Plate or Size Control
- Built-In Trap for Tramp Metal
- Capacities up to 7 TPH

**WRITE for Literature on American Wood Hogs**

American PULVERIZER COMPANY

*Originators and Manufacturers of Ring Crushers and Pulverizers*

1510 Macklind Ave.
St. Louis 10, Mo.

## WOOD-TURNERS SERVICE BUREAU

This bureau, which is the trade association for the manufacture of turned and shaped wood products, will hold its annual meeting at the Hotel Statler, Boston, on January, 1956.

The program will include the election of officers and the discussion of current problems in the industry, and there will be speakers who are experts in the various fields of interest.

## LODDING EXPANDS

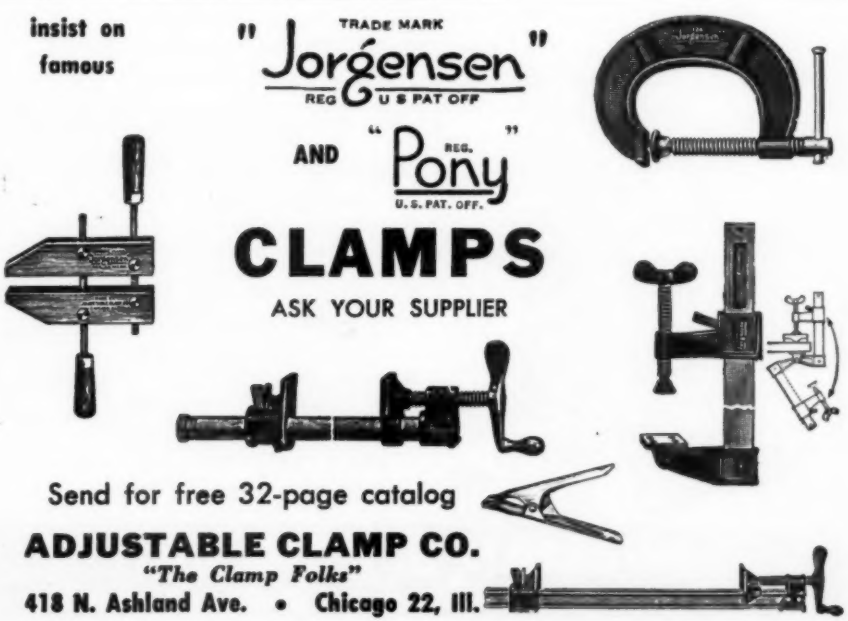
Lodding Engineering Corporation, Worcester, Massachusetts, well known makers of doctors and blades has acquired Bailey and Blendinger Company of Union, New Hampshire, long established makers of machine knives. The resources of Lodding and the traditional craftsmanship of the now B & B Division will be united in the service of Lodding's field representatives.

The products of the B & B Division of Lodding Engineering Corporation include chipper and hog knives for pulp mills and paper knives for paper mills. Sales will be handled in New England by C. S. Connington of Barre, Mass.; on the West Coast by R. T. Barnes, Jr. of Burlingame, Calif., and in the rest of the United States by the W. E. Greene Corp., Woolworth Bldg., New York, N.Y.

## WOODWORKING FACILITIES SOLD

The manufacturing facilities of Grand Rapids Store Equipment Corp., Grand Rapids, Mich., have been purchased by Weber Showcase & Fixture Co., Inc., Los Angeles, Calif. This was announced by Sidney G. Rose, Cincinnati, chairman of Grand Rapids Store Equipment, and Karl Weber, president of Weber Showcase.

The plant consisting of 500,000 square feet of manufacturing space and ma-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chinery will be utilized for the manufacture of Weber equipment. No purchase price was given. The purchase brings together manufacturing facilities of two of the largest woodworking firms in the world, and gives a combined manufacturing space of approximately 1,500,000 square feet.

## BAXTER D. WHITNEY DEALER MEETING

Thirty representatives of Baxter D. Whitney & Son, Inc., Winchendon, Massachusetts, assembled recently at the Greensboro, North Carolina office to discuss production and sales problems and to lay plans for the future.

W. H. Morlock, president of the Whitney Company, presided over the two-day session. Short talks were heard by Elliot D. May, vice-president; Guy R. Prebble, clerk and production controller; Lynn Young, service engineer; and Henry D. Boucher, chief inspector, all of whom now reside in Greensboro and supervise the production of Whitney machines.

The visiting representatives were given a thorough and complete tour of the modern manufacturing facilities of Newman Machine Company, Inc. where the entire line of Baxter D. Whitney machines is now manufactured.

Service Engineer Lynn Young presented actual demonstrations of the Whitney No. 600 Facer as well as the new Whitney No. 206 Surfacer and Whitney No. 99 Automatic Shaper.

Other representatives attending this dealer meeting were: James T. Donnolly of James T. Donnolly Company, Ltd., Toronto, Canada; L. P. and John Monks of Hermance Machine Company, Williamsport, Pa.; A. E. Soulages of Idaco Company, Oakland, California; Donald R. Weare of Lakeshore Machinery Company, Milwaukee; F. P. Loveland of F. P. Loveland & Associates, Chippewa Falls, Wisconsin; C. J. Meisel of Meisel Machinery Company, Huntington, West Virginia; C. H. and Carroll Cowan of Memphis Machinery

No. 45-20-18

THOUSANDS OF PROBLEMS HAVE BEEN SOLVED BY

DOIG AUTOMATIC NAILERS

Standard Doig Features

1. Anti-friction bearings.
2. Three separate motorized drives.
3. Nail feeder to handle nails from 1 to 3 inches without additional parts required.
4. Nail feeders to give 12 separate nailing combinations.

NEW FEATURES

A. Wheel on left allows operator to adjust back gage from operating position.
B. Solenoid trip permits operator to trip machine at any position desired.

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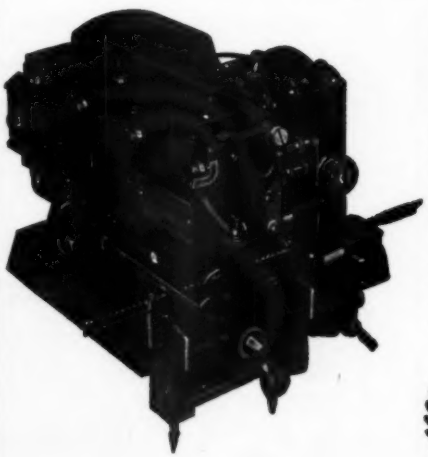
and Supply Company, Memphis; E. B. and Cliff Mueller of Edward B. Mueller and Company, Cincinnati; Robert R. Parks, Nicholas and Parks Machinery Company, Dallas; G. S. MacDowell and John Davis of Production Machinery Sales, Mount Vernon, New York; Warren E. Ricketts, Sr. and Warren E. Ricketts, Jr., of Warren E. Ricketts & Son, Jamestown, New York; M. C. and Burnell Diehl of B. M. Root Company, York, Pa.; Claude Sutton, Sr. and Claude Sutton, Jr. of Sutton Woodworking Machine Company, Greensboro, N. C.; H. D. Smith and R. L.


# The Amazing Wardwell "K5"



## Joints, Sets, Files BAND SAWS in One Operation

Exclusive joint—set—file operation sharpens 60 teeth a minute. Increases efficiency by from 30 to 50%.

Saw is firmly locked by solid steel cam when being filed and set. Absolute uniformity assured.

Another special and important time saving feature is that "K5" saves cost of a second operation.

"K5" is the choice of manufacturers everywhere. Send for descriptive literature.

WARDWELL MANUFACTURING CO.
3806 Ridge Rd., Cleve. 9, O.

MAKER OF LARGEST LINE OF SAW AND TOOL SHARPENING MACHINES

Mullins of Tri-State Machinery Company, Dallas; Frank J. Hoffman and John Rice of Frank J. Hoffman, Chicago; Wm. J. Trosclair of Wm. J. Trosclair, New Orleans; E. G. Ekstrom of Wagner Machinery Company, Los Angeles.

## ELECTRONIC HEATING SOLD

Announcement is made of the purchase of the assets of Electronic Heating Corp. by a group of Boston Industrialists. The firm name of the new company is the Raybond Electronics, Inc.

The conduct of operations will be by David Racoosin, former general manager of Electronic Heating Corp. and Herbert Reed, Chief Engineer, also formerly of Electronic Heating Corp.

The company has leased the plant formerly occupied by Electronic Heating Corp. at 66 Needham St., Newton Highlands, Mass.

Equipment now being manufactured by the company for the woodworking industry include the Raybond line of edge-gluing machines, general purpose generators, laminating presses, lumber edge-banding presses, panel-on-frame equipment, spot-welders and glue spreaders.

## APPOINTMENTS

**Henry J. Erisman,** formerly assistant secretary, has been named comptroller of DeWalt Inc. He has been with the firm since 1935.

New vice-president of Armour and Company, Chicago, is **F. B. Patton.** He has previously been manager of the glycerine department, soap department and chemical division.

**Edmund L. Fitch** has been appointed sales promotion manager for the Howe Scale Co., Inc., Rutland, Vermont.

Delta Power Tool Division, Rockwell Manufacturing Co., has promoted **George J. Groya,** former Chicago district manager, to the position of service manager of the organization. He will headquarter at the Pittsburgh offices.

## PRENTICE ADDS DISTRIBUTORS

The E. V. Prentice Co., 2303 North Randolph St., Portland, Oregon, manufacturers and distributors of machinery and equipment for the veneer and plywood industry, have announced the appointment of four new distributors on a nation-wide basis. This step has been made necessary, reports Tom Prentice, one of the partners of the E. V. Prentice


NEW!

MARCOLOY CARBIDE DOVETAIL BITS

Eliminate "down time" on your dovetailers with carbide bits. A perfect cut gives you a perfect match. Write for catalog and prices.

MARCOLOY CARBIDE ROUTER BITS

Improved design is 5-ways better. New low prices. Write for folder.

MARCOLOY CARBIDES

MARCOLOY, INC.
Springdale, Conn.

Co., owing to the increased demand for the Victor line of jointers, clippers and other pieces of equipment, as well as the Raimann line of knot-boring and plugging machines and veneer patchers.

The Chas. E. Francis Co., Inc. of Huntington, Indiana, will handle the E. V. Prentice equipment throughout the central area of the U.S. In New England, New York and Pennsylvania, sales will be handled by Ericsson Merritt, Inc., 532 Pine St., Lockport, N.Y. The region from Virginia down the south Atlantic coast and the eastern half of Tennessee will be handled by the Sutton Woodworking Machine Co., Sedgefield Inn, Greensboro, N.C.; George A. Risell, 879 St. Charles Ave., N.E. Atlanta, Georgia, will look after distribution in Alabama and Georgia.

## PALLET ASSOCIATION TO HOLD SEMI-ANNUAL MEETING

The 9th Semi-Annual Meeting of the National Wooden Pallet Manufacturers Association will be held at Ellinor Village in Daytona Beach, Florida, from January 22-24, 1956.

The 1956 trade promotion program, which will include publication of a set of grading and inspection rules, a leaflet of expendable or shipping pallets, and a pamphlet on the care and maintenance of wooden pallets, will be discussed and approved at these sessions. A research and development program for the pallet industry will also come up for consideration by NWPMA. The election of NWPMA officers and Board of Directors to serve during 1956 will also take place at the semi-annual meeting.

Non-members of NWPMA will be welcome at some of the meeting sessions, and may secure invitations for attendance plus program particulars by writing to the National Wooden Pallet Manufacturers Association, 215 Barr Building, Washington 6, D.C.

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Change is not always growth, just as movement is not always forward.

Reduce Costs by assembling your products easier and stronger with "Rockford" Quality Controlled Threaded Fasteners.
We manufacture a complete line.
Cap and Set Screws
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Studs
• Machine Screws and Stove Bolts
Nuts — Square & Hexagon
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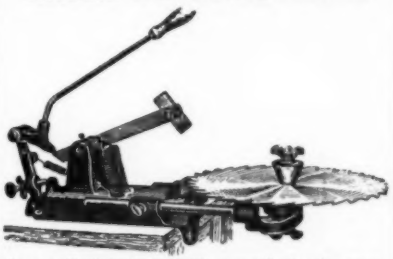
**SIMPLEX**
**CIRCULAR SAW SETTING MACHINE**



An excellent tool for setting small circular saws. The successful operation of all circular saws depends largely upon the manner in which they are fitted.

To obtain the best results the teeth should be properly and evenly set.

This machine does the work perfectly, insuring easy and true running and smooth cutting.

The hammer strikes every blow with equal force and at the same angle hence the set of each tooth is absolutely uniform. Will give a light, medium or heavy set.

Adjustable for saws, either rip or cut-off, from 5" to 24" in diameter.

The machine will last for years if handled with ordinary care and intelligence.

Further details upon request

**ZEILLER & NAGEL, INC.**
232 JAVA ST. BROOKLYN 22, N.Y.

# *Up-to-date* INFORMATION

about equipment and supplies as featured by our advertisers in this particular issue. All of our advertisers will be glad to send information about their products, but we have listed the following firms because they have mentioned booklets in their advertising copy.

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Econaway Mfg. Co., page 98, Literature.

**ABRASIVES**
Minnesota Mining & Mfg. Co., page 86, Booklet.

**ADHESIVES**
Koppers Co., page 19, Booklet.
Rohm & Haas Co., page 33, Sample.

**BITS & DRILLS**
Greenlee Tool Co., page 6, Catalog 34-M.
Virginia Mach. Tool Co., page 18, Catalog.
Onsrud Cutter Mfg. Co., page 162, Bulletin.
Marcoley Inc., page 172, Folder.

**CLAMPS**
J. L. Taylor Mfg. Co., page 76, Catalog.
Adjustable Clamp Co., page 169, Catalog.

**CUTTERS & KNIVES**
G. M. Diehl Mach. Works, page 38, Bulletin 452.
Jones & Orth Cutter Head Co., page 69, Catalog.

**DRY KILNS**
Standard Dry Kiln Co., page 56, Booklet.

**DUST COLLECTING SYSTEMS**
Aget Mfg. Co., page 157, Literature.
Matthews Blow Pipe Co., page 110, Bulletin.

**GLUING EQUIPMENT**
Black Bros. Co., page 7, Bulletin 11-I.

**HIGH FREQUENCY BONDING EQUIPMENT**
Radio Receptor Co., page 48-49, Bulletin.

**HOGS**
Wm. Patent Crusher & Pulverizer Co., page 27, Brochure.
American Pulverizer Co., page 168, Literature.
Jacksonville Blow Pipe Co., page 179, Bulletin.

**MOISTURE METERS**
Weston Moisture Meters, page 22, Bulletins.

**MORTISERS**
Greenlee Bros. & Co., page 58, Bulletin 227.
U. S. Cutting Chain, page 154, Circular.

**MOULDERS**
Yates-American, pages 16-17, Bulletin.

**PARTICLE BOARD**
Weyerhaeuser Sales Co., page 26, Booklet.

**PLANERS & SURFACERS**
Baxter D. Whitney & Son, page 13, Bulletin D1.
Buss Machine Works, Inside Back Cover, Bulletins.

**PRESSES, PLYWOOD**
Lodge & Shipley Co., page 139, Bulletin HP-10.

**RIPPERS**
Mattison Machine Works, Back Cover, Circular.

**SANDING MACHINES & EQUIPMENT**
Sand-Rite Mfg. Co., page 94, Circular.
National Air Sander, page 100, Catalog.

**SAW BLADES, SAWING MACHINERY & EQUIPMENT**
Oliver Machinery Co., page 1, Bulletin 88.
Beach Mfg. Co., page 4, Literature.
Delta Power Tool, page 24-25, Catalog.
AMF DeWalt, page 43, Booklet.
Boice-Crane Co., page 72, Catalog.
Mereen Johnson Mach. Co., pages 114-115, Bulletin 300.
L. S. Starrett Co., page 181, Bulletin WW.

**SAW SHARPENERS & SETTING**
Wardwell Mfg. Co., page 171, Literature.
Foley Mfg. Co., page 185, Manual.

**SCREWS**
Southern Screw Co., page 163, Samples.

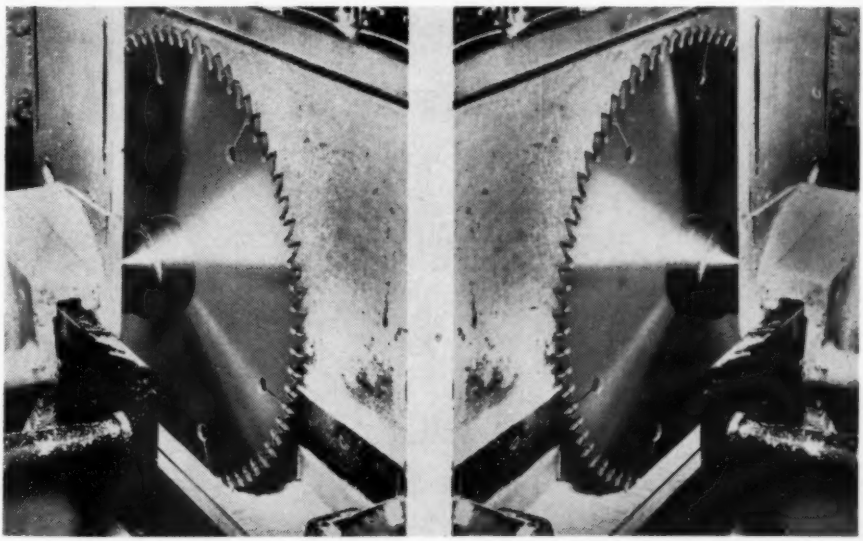
**SHAPERS**
Moak Mach. & Tool Co., page 189, Booklet.

**TACKERS**
Fastener Corporation, page 51, Catalog.

**TENONERS**
Mereen Johnson Mach. Co., pages 114-115, Bulletin 400.

# EQUIPMENT AND SUPPLIES for the WOODWORKING INDUSTRY

## CARBIDE-TIPPED SAW BLADES WORK IN PAIRS



Claiming a finer finish with fewer teeth, DeLuxe Saw & Tool Company has marketed a new line of blades under the name of Karbide-King trim side.

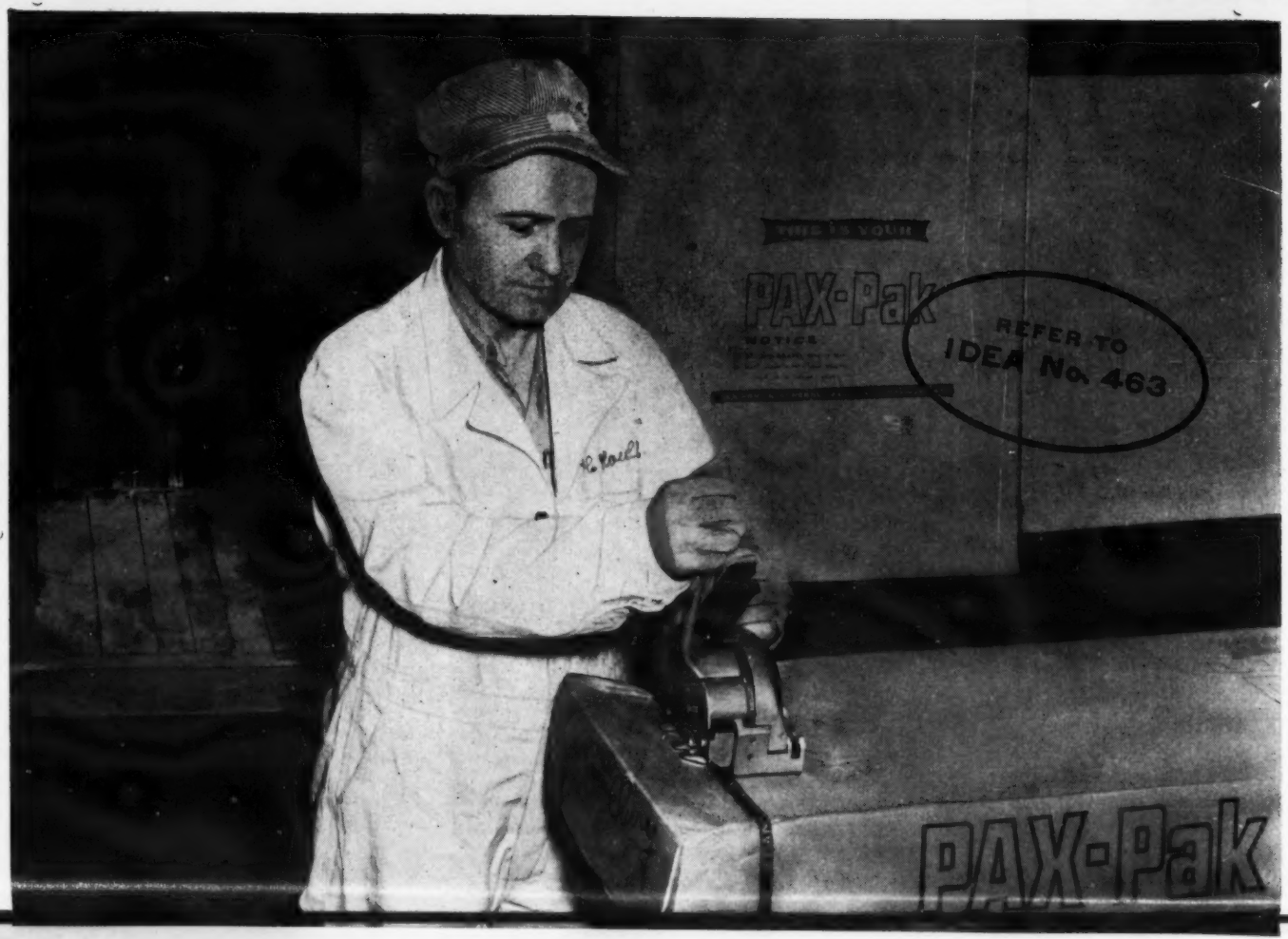
These blades are made especially for all operations where right and left hand blades are used in pairs for simultaneous cuttings in panel sizing, dimension trim work, double-end trim miter operations, or for any other work where only one side of the cut is required to be smooth and chip-free.

This newly-developed blade design, due to fewer teeth, is said to result in a greater ease of operation, less operator fatigue and lower power consumption. All trim side blades are made for both hand and power feed machines.

DeLuxe Saw & Tool Company, with main office and plant in High Point, N.C., manufactures a complete line of carbide-tipped saw blades and tools for woodworking.

## WELDWOOD WOOD-TRIM

An inch-wide tape of wood veneer, so thin and flexible that it is packaged in rolls, is being introduced by United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PAX-Pak
NOTICE
REFER TO
IDEA No. 463
PAX-Pak

# AIM* for better do-it-yourself packages with Acme Steel Strapping Ideas

Like every Acme Idea Man, Al Boerner, Kansas City, constantly keeps his customers abreast of new strapping ideas

ask your *Acme Idea Man to help solve your problems

By offering fine hardwoods and plywoods in steel strapped packages, the Frank Paxton Lumber Co., Kansas City, is enjoying new found profit. (Idea 463). The steel strapped fibreboard boxes hold odd lengths and widths of "refined lumber" . . . pieces that ordinarily are hard to package and handle. But with Pax-Pak, different varieties of lumber for home woodworking projects are easily packed and strapped.

The container protects fine woods, simplifies stock keeping, makes storage easy. When on display, Pax-Pak sell on impulse to the do-it-yourself enthusiast.

Your Acme Idea Man is prepared to offer you many profitable steel strapping ideas. Without obligation he will recommend a profitable strapping method for you. Consult your local telephone directory for his number. Or for further information write to Dept. CX-125.

ACME STEEL PRODUCTS DIVISION

## ACME STEEL COMPANY

2840 ARCHER AVENUE, CHICAGO 8, ILLINOIS • ACME STEEL CO. OF CANADA, LTD., TORONTO

ACME STEEL

States Plywood Corporation to solve the problem of exposed plywood edges.

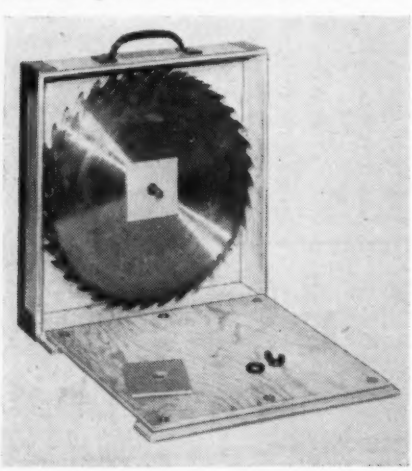
The new material is called Weldwood Flexible Wood-Trim. It is available in mahogany, oak, walnut, birch and Korina.

Wood-Trim can match the exposed edges of plywood to the face of the panel, even when edges are curved. The new product can also be used for lumber edging and decorative purposes in the home.

Information about the material is available from the U.S. Plywood Corp., 55 W. 44th St., New York City.

## CARRYING CASES

Storage of circular saw blades is simplified with the Bel-Hil carrying cases. These cases are designed to protect all types of circular saws and dado cutters from damage in handling. The cases are made of ¼" plywood and will hold 5 to 7 saws. Six separators for spacing saws and washer and wing nut for positive closures are used in

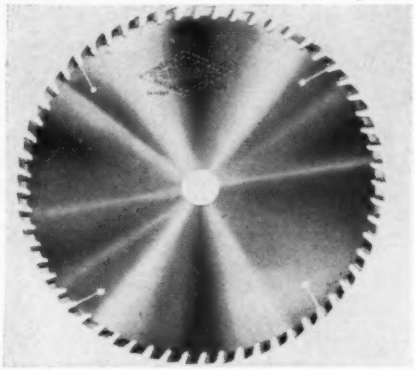


each case. The substantial handle is securely riveted to give safe and easy carrying arrangement.

These cases are available in a variety of sizes from Bel-Hil Products Co., 100 Grove St., Worcester, Mass.

## CARBIDE TIPPED SAW

Victory Carbide Saw & Tool Co. has announced the modern, new Victory BT 45 carbide tipped saw for all hand-feed and radial arm saw operations.



The Victory BT 45 cuts a thin kerf with a tried and proven design of alternate rough and finish cutting teeth to divide the work which results in easy, free, smooth and safe cutting. Engineered for ripping, cross-cutting and mitreing, production is stepped up on all types of materials, such as laminated plastics, plywoods, hard and soft woods, compositions, fibres and non-ferrous alloys.

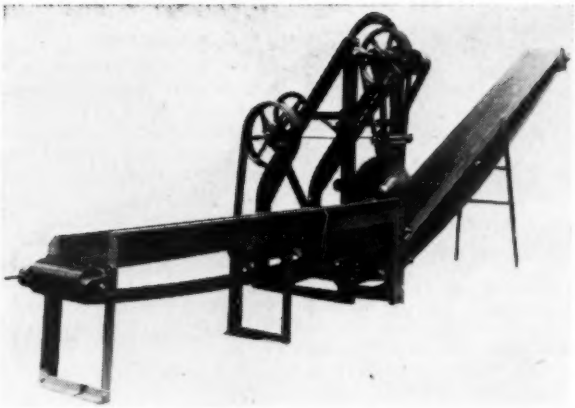
The Victory BT 45 allows sufficient clearances on both tops and sides of teeth to eliminate burning while cutting. This greatly increases the "cutting life" of the blade between sharpenings for the life of the saw.

For further information and literature write Victory Carbide Saw & Tool Co., 3856 N. Ashland Ave., Chicago 13, Ill.

## AUTOMATIC WOOD SAW

This patented automatic wood saw, sometimes called a slab saw, is manufactured by General Foundry & Machine Company of Sanford, North Carolina.

It has been on the market since 1948 and the current model has been completely re-designed to take advantage of



present day engineering inventiveness.

It cuts up slabs or lumber automatically with pre-set lengths of 3" to 24" and a cut tolerance of from ¼" to ½". Wood up to 16" wide, 12' or more long, and in any thickness, stacked up to 6", is loaded on feed conveyor. Wood automatically feeds into 24" high-speed saw, cut pieces travel along discharge conveyor, height adjustable on telescoping legs.

From moment long lengths are placed on feed conveyor, all work including loading of cut pieces is done automatically, at a labor savings of 75%. Sawmills and lumber yards re-

C.I.T. Terms Available
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**JACKSONVILLE BLOW PIPE CO.**
*Jacksonville, Florida*
P. O. Box 3687

*The Marvelous Montgomery*

**BLO-HOG** (The only all-purpose hog in the world) Patents Pending

***EATS UP EVERYTHING***

. . . including Pine, Oak, Gum, Hickory, Elm, Cedar, Wet Veneer and Sandy Bark. Conveyor-fed — no attendant required. Positively protected from major damage by tramp steel. All connections locked — nothing to shake loose. Maintenance costs unbelievably low.

*". . . Dear Mr. Montgomery: It is an unbelievable machine and it is still hard to believe that it is actually handling the enormous volume of scrap we are feeding into it. We operate the hog without an attendant—which means a considerable saving."* — J. B. BLACK, Ocala Mfg. Co., Ocala, Fla.

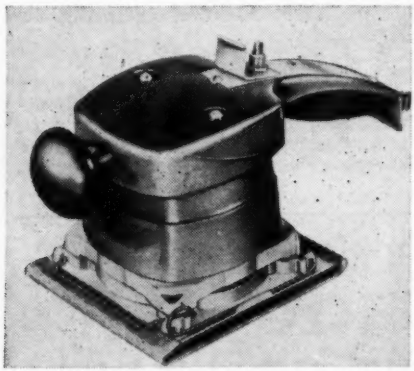
Sumner Iron Works, Everett, Washington, W. Coast Rep.
Canadian Sumner Iron Works, Ltd., Vancouver, B.C., Canadian Rep.

duce slabs to firewood or for the hog. In woodworking factories, some built into production lines, the automatic wood saw both disposes of unwanted long lengths or cuts up lumber for production use.

## THOR SPEEDSANDER

A new electric, orbital-motion sander —the No. 15T Thor SpeedSander—has been announced by the SpeedWay Manufacturing division of Thor Power Tool Company, Aurora, Illinois.

With a sanding area 4½" x 5⅛" and weighing only five pounds, the Thor SpeedSander has anti-friction, oil-sealed bearings, direct-connected, air-

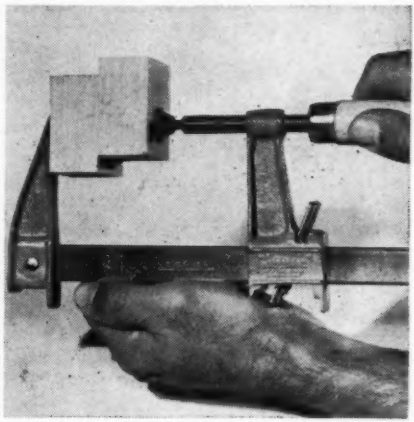


cooled motor, and a rugged, blue hammerloid cast aluminum body. The motor is a 2-pole, induction type and operates on 115-volt, 60-cycle AC only. A 6-foot, 2-conductor lead cord is standard equipment. Models using other voltages at 50-cycle are also available.

With its new No. 15T SpeedSander Thor will make available a number of packages of aluminum oxide and silicon carbide faced sanding sheets of varying coarseness. Other appliances being offered are wool felt rubbing pads for use with free abrasives, a contour plate assembly for finishing curved or irregular surfaces, a lamb's wool polishing pad, and steel surfacing plate for sanding fir plywoods evenly.

## "JORGENSEN" BAR CLAMP

"Style No. 37" is the designation given to the newest member of the "Jorgensen" family of steel bar clamps. It is very light in weight, and features the new-design "extended" multiple disc clutch for easiest and most convenient release after clamping. Finger

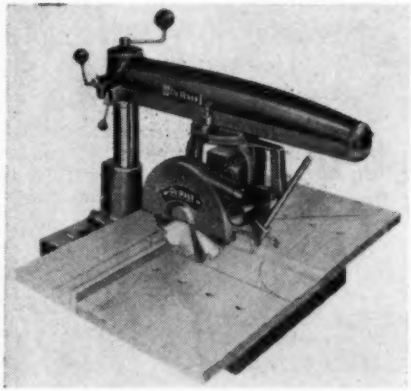


pressure on the clutch, either above or below the clamp bar, releases the sliding head for instant adjustment. The clutch grips the bar automatically any place on the bar, is simple and fool-proof in construction.

The clamps are attractively finished in traditional "Jorgensen" orange baked-enamel. Capacities range from 6" to 24"—all sizes "reach" 2½" from the bar. Complete details are available from the manufacturers, Adjustable Clamp Company, 418 No. Ashland Ave., Chicago 22, Ill.

## DE WALT "POWER SHOP"

The 1956 Model of the popular "Power Shop" multi-purpose woodworking machines by DeWalt Inc., incorporates 12 major design changes. Designated the Model MBF (replacing a previous Model MBC), the new machine is powered by a ¾ h.p., U.L. and C.S.A. approved, direct-drive motor. This motor has 50%



more power than that of the previous model.

In addition to the increased power, the 1956 "Power Shop" also offers 11 other new features. Noteworthy among these features are the following: A specially designed top-quality combination saw blade; a new white-face bevel scale, re-positioned for easier, more accurate reading; sintered metal rip lock and miter latch with red plastic control knob for easier locating and faster adjustments; dust proofed relay boxes and thermal over-load protectors; new white-face rip scale; and a tamper-proof rotary safety starting switch assembly.

Basically a specialized circular saw, the "Power Shop" unit quickly converts for other woodworking jobs such as sanding, shaping, boring, routing, surfacing, and lathe and dado work.

### "RED TANG" FILES

Simonds Saw and Steel Company, Fitchburg, Massachusetts, announces a complete line of "Red Tang" Files including American pattern files and rasps, "American-Swiss" Swiss pattern files, "Vixen" milled curved-tooth files and holders, and rotary files and burrs.

With this expanded, complete line of files, Simonds can now supply a file for every need regardless of application.


Starrett

BAND SAW BLADES

**'SKIP-TOOTH"**

**Unsurpassed for fast clean cutting of hardwoods, softwoods, plastics, fibre, wood substitutes.**

**REGULAR**

**For all types of band saw machines. Furnished cut to length and welded or in coils in handy reel dispenser.**

**Order Through Your Distributor Or Write for Bulletin "WW" Which Gives Complete Information.**

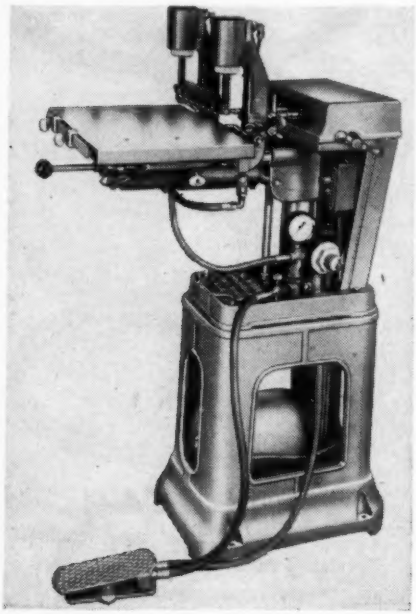
Starrett

THE L.S. STARRETT COMPANY · ATHOL, MASS., U.S.A.

Complete information on the full line of Simonds "Red Tang" files may be obtained from Simonds Branches located in Boston, Chicago, San Francisco and Portland, Oregon or from the home office in Fitchburg, Mass.

## NEWTON BORER

A two spindle horizontal type borer is offered by the Newton Manufacturing Company of Temple, Tex. This borer is air operated and is equipped with spindles for 1" minimum centers on the drill bits.

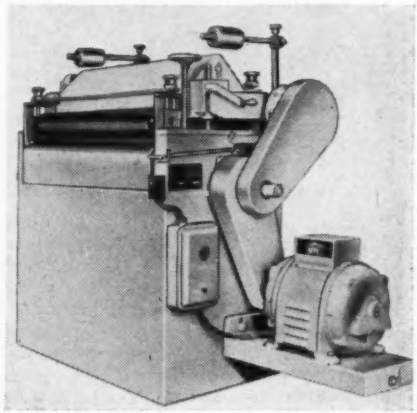


Clamping and unclamping of the work is automatic, requiring only that the operator place the work piece under the clamp and remove it after drilling. A full-floating pressure plate on the clamp bar automatically levels off to the surface of the work piece the instant pressure is applied, thus avoiding the possibility of marring the piece.

The Newton BA-600 borer is also available as a manually operated machine.

## TIMESAVER SPEEDSANDER

Timesaver Speedsanders can now be equipped with an ammeter control feature to regulate and register stock removal on all sanding operations.



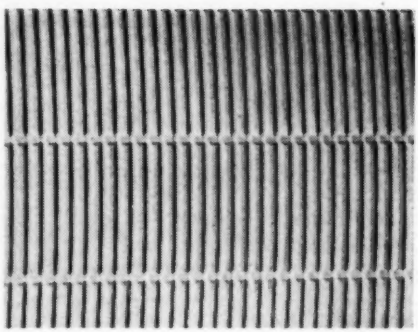
Mounted on the motor for easy visibility, this feature registers ratio of draw of abrasive belt against work being sanded. The operator is then able to make a direct adjustment of the pressure rolls to control stock removal. Use of the ammeter control feature also increases abrasive belt life by efficient utilization.

For further information write direct to Timesavers, Inc., P.O. Box L, Robbinsdale 22, Minnesota.

## RESILIENT GLUING ROLLS

Resilient gluing rolls are used for two reasons, according to Black Bros. Co.: (1) to conform to stock irregularities, and (2) to provide better control over the amount of glue deposited.

Both natural and synthetic rubber are suitable, but synthetic is usually better because of its high resistance to the absorption of solvents. The re-



silient surface is helically grooved to control the amount of glue deposited. Any range of coating required may be had by varying the grooving.

Black Brothers' wide experience led to the following described composite grooving: Many door and plastic faced panel manufacturers throughout the country are using a composite grooving to good advantage on their glue spreader rolls. Instead of the conventional helical type grooving used for plywood and panel laminating, a special composite grooving consisting of both helical and lengthwise grooves is used which applies an even and economical glue line to one or two sides of the door frame assembly. The grooving is especially advantageous when using the polyvinyl adhesives.

This grooving tends to eliminate the "wring-off" on the sides and trailing edge of the frame as it passes between the gluing rolls.

The picture shows the grooving enlarged 1¼ times with 9 helical grooves to the inch and lengthwise grooves spaced approximately 1" apart.

## TWO NEW HARDENERS

Synvar Corporation announces the development and marketing of two new hardener catalysts for the woodworking industry.

The two new liquid hardeners, designated as 190 and 192, have many

**For extra TOUGH tacking**
**®Senco model BNFX**

Designed specifically for difficult jobs such as metal channels, masonite, extremely hard casebacks in furniture, weatherstripping, etc. This profit making pneumatic tacker *braces* LOW CARBON staples flush into the hardest of woods eliminating the need for costly high carbon staples. It is the lightest tool to drive up to a ⅝" leg staple.

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unusual features and can be used throughout all hot-press, lumber core, high frequency and chip-core applications.

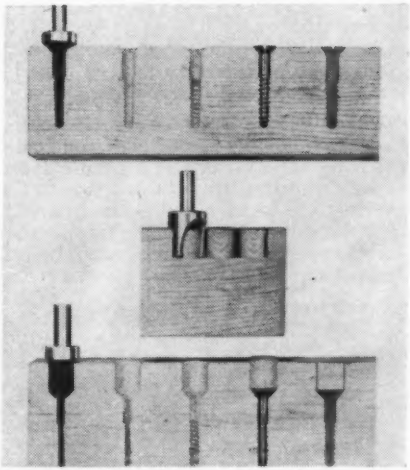
Both hardeners give excellent pot life, eliminate the danger of precure, remain practically unchanged even in an open container, and improve the shear strength of veneers.

Additional information is available from the Synvar Corp., 415 E. Front St., Wilmington, Del.

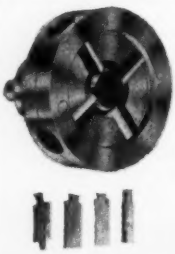
## SCREW-MATE FOR WOOD SCREWS

A shortcut in fastening wood with screws is provided by the Screw-Mate, a three-way combination bit which bores pilot and shank holes, then countersinks for the screw head.

Product of Stanley Electric Tools, the Stanley Works, New Britain, Conn., this triple-play bit features a built-in taper which matches the root diameter of the screw and thus gives each thread its maximum holding power.



*Cross-sectional photo shows how Stanley Screw-Mate counterbores and plugs cutter work in wood.*



**At Left**

**Style "C" Chucking Cutter — for Square Shouldered Pins ¼" to 1" Dia.**

**At Right**

**B-100 Two-Spindle Borer. 1" to 7½" Centers.**

OTHER CUTTERS & BORERS TO CHOOSE FROM
—SEE YOUR MACHINERY DEALER OR WRITE DIRECT TO —

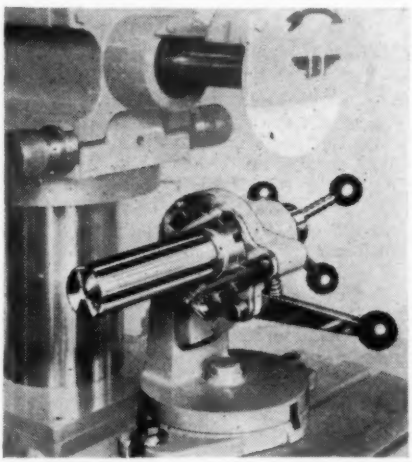
**NEWTON MFG. CO. Temple, Texas**

A shoulder prevents over-boring, and the Screw-Mate's threefold action makes it possible to drill and countersink as many as 40 holes per minute in a straightline operation. High tungsten steel, precisely hardened and ground, is said to make the Screw-Mate outlast ordinary drills.

### GRINDING FIXTURE

An entirely new gauge index for speedy and accurate grinding of cutterheads has been developed by Dependable Machine Company, Greensboro, N.C.

Known as the G-12 cutterhead grinding fixture, it is adaptable to pratically all cutterhead grinders, regardless of make or model. It will accurately handle heads with bores from ½" to 2½". Heads up to 12" long are easily handled when fixture is equipped with center stand.



The G-12 is equipped with a 12 notch index sleeve which is suitable for grinding heads with 1, 2, 3, 4, 6, 8 or 12 knives. Hardened steel surfaces assure accuracy. Entire index mechanism is enclosed to protect machined parts from grinding dust.

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This free book is based on experience of Foley precision saw filing equipment in thousands of plants. Contains pictures and data showing how firms have increased production 25% to 40%, lengthened saw life, reduced breakage. Book shows how automatic sharpening can benefit you. Request Manual No. 100—no obligation.

FOLEY MANUFACTURING CO., 3351 N.E. 5th St., Mpls. 18, Minn.

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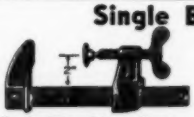

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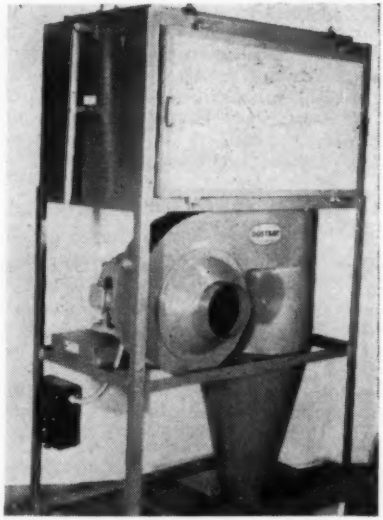
Quick adjusting, self-locking and unlocking . . . both styles tested for safe clamping strain of 1800 lbs.

HARTFORD CLAMP COMPANY • EAST HARTFORD, CONN.

Extra equipment includes a spring pointer mechanism, roller setting gauge, a dial indicator and a diamond wheel dresser. A special Jacobs chuck arbor is furnished for grinding router bits, drills and other straight shank cutters.

## DUST COLLECTORS

Production of standard models of industrial dust collecting equipment, without the standard dust bin attached,



has been announced by Aget Manufacturing Company, Adrian, Michigan. A collector, such as the DUSTKOP Model 2030 shown here, has been demanded for many installations where collected dust runs to unusually high volume, or where factory floor space is at a premium.

Upon installation of the DUSTKOP collector, a storage bin is constructed by the customer to meet his particular storage and dust removal requirements, and placed outside the building or inside where space allows. The collector itself may then be located overhead in ceiling girders or on the roof, and connected to the bin by a pipe ex-

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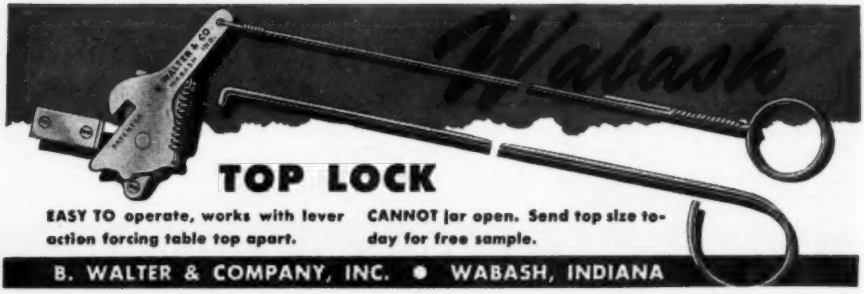
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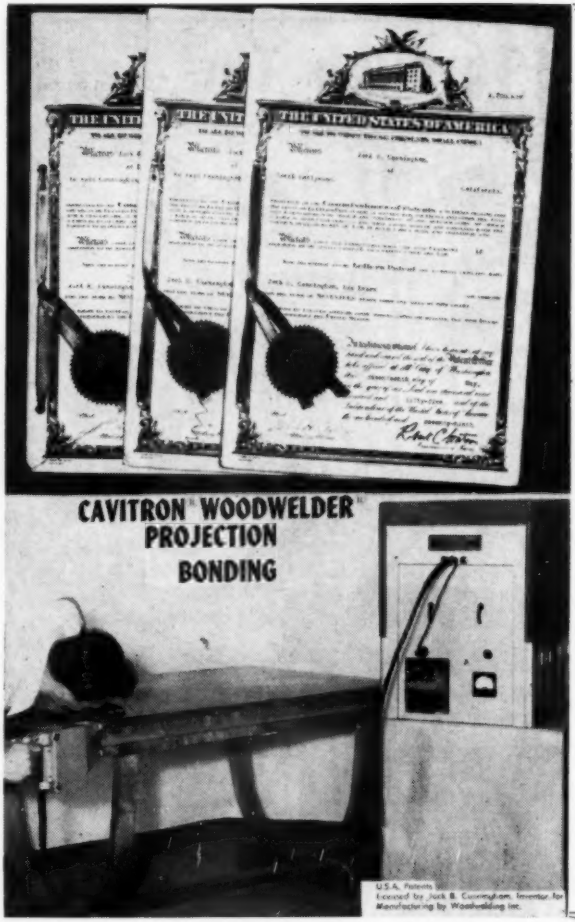


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**WOODWELDER MFG.**
**Plant No. 2,**
**355 N. Newport Blvd.**
**Newport Beach, Calif.**

U.S.A. Patents
Licensed by Jack B. Cunningham, Inventor, for Manufacturing by Woodwelding Inc.

tended downward at an angle of no less than 45°.

## MACHINE FOR DOOR MANUFACTURERS

An automatic machine for routing hinge pockets, boring lock holes and mortising lock plate openings has recently been developed by the Novi Tool & Machine Company of Novi, Michigan.

The machine is adjustable for performing these operations on all doors, both right and left hand, having a thickness of from 1⅜" to 1¾", widths from 18" to 3' and heights from 6' to 8'.

All of the operations mentioned above can be performed at the rate of from 50 to 60 doors per hour with unskilled operators.

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A bachelor is a man who never Mrs. anything.

# Mechanics Through The Ages

AMONG THE MECHANICAL INVENTIONS CREDITED TO LEONARDO DA VINCI, FAMED PAINTER, ARCHITECT AND ENGINEER OF 16th CENTURY ITALY, WERE THE SILK WINDING MACHINE, THE ALARM CLOCK, THE WHEELBARROW, THE ANTI-FRICTION ROLLER BEARING, LINK CHAINS AND SPIRAL GEARS.
IN THE MIDDLE AGES MEMBERS OF CRAFT GUILDS WERE OBLIGED TO HAVE TOOLS APPROVED AS "GOOD AND HONEST" BEFORE USING THEM ON ANY JOB.
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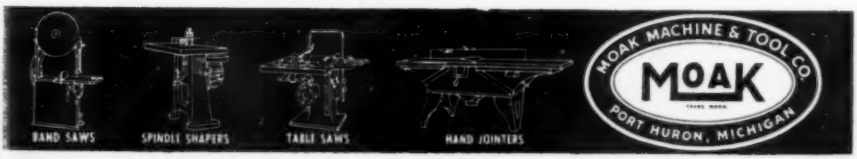
***Get the facts* on Moak Shapers and Speedikut Cutters. Write for colorful illustrated booklets today.**



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If you will list below the wood-working machines, supplies or machine shop equipment in which you are interested and mail this page to us, we shall be glad to refer your needs to the manufacturers or others in position to serve you. Replies will come from them — not from us.

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Air Compressors, various sizes
Band Saws, Amer. 42", Belted MD
Band Saw, Greenlee No. 410, 36" bb, dmd
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Borer, Andrews 3 spindle vertical bed
Borer, J. Superior 2 spdle, horiz. M.D.
Borers, Greenlee No. 369—5' DMD
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Boring & Sawing, McKnight 26F dmd
Carvers, Y-A, and Porter BB, DMD
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Jointers, Yates No. 199, 12" bb. v-belt drive
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Lathe, Yates No. 74 bb-dmd
Mortiser, Sidney, single-spindle pb. bd.
Mortiser, New Britain No. 7 bd. & motor
Mortiser, W&M No. 288—5 spindle Horiz. dmd
Moulders, Yates-American C88, 8" bb-dmd
Moulders, Yates-American C-89—6" bb-dmd
Planer: Whitney 30" Sgl. BB, dmd
Planers, F&E—30" double, pb. bd & motors
Planers, Berlin 36" round head dmd
Planers, New Crescent 24" bb-dmd
Planers, Buss, 44, 36" sgl. bb, dmd.
Planer, F&E No. 156 36x7 dmd. round head
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Redrier, Merritt 12 plate 36x72
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Routers, Defiance single spindle high speed dmd
Sanders, Indiana Mldg. bb, dmd.
Sander, Yates No. 430, semi-stroke, bb-dmd
Sander, Yates No. 431—42" 3 drum endless dmd
Sanders, Niagara brush, bb-dmd
Sander, 48" double disc, dmd
Sanders, F&E 60" 3-drum roll feed, dmd
Sanders, McKnight single drum 24"x16" dmd
Sander, W&M No. 171 belt bb., m.d.
Saws, Hermance 300G Gang Rip. dd. dmd.
Saws, Mattison No. 207, bb, dmd.
Saws, F. & E. No. 530, bb., dmd.
Saws, Beach dbl. cutoff, bb. & motor
Saws, Greenlee No. 493, variety, bb-dmd
Saws, Hermance Gang Rip, pb & motor
Saws, New Delta-Crescent 12" tilting arbor dmd
Saws, New Multiplex 40A & 50A
Saws, Porter C-43, cutoff, bb-dmd, & tables
Shapers: Onsrud No. 200 Sgl. bb, dmd.
Shaper, Defiance double spindle, bb-dmd
Shaper, Whitney No. 389, double bb-dmd
Shapers, New Moak single spindle bb-dmd
Shapers, Greenlee No. 180 double bb-dmd
Shaper, Whitney double spindle, bb-dmd
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Ekstrom, Carlson 6" All Electric Moulder
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Borer, 48" Bell No. 205 horiz. multiple head, late type and practically new.
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Grinder, Wisconsin Model "K" Cutter, late type and practically new.
Moulder, 8" Mattison No. 229 Electric NEW.
Planer, 30" Whitney sgl. sq. head, with motor.
Sander, 48" Smith No. 404 end. bed, BB. M.D.

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Band saw, Egan 32 in. M.D., $175
Clamp carrier; Billstrom 30 sec., $350
Belt sanders, roll table hand block, real bargains, $150 and up.
Blowers, Shaving 40 and 50 in., $100 ea.
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Lathe, American 20 in., Wood, $75
Planer, 30 in. Yates, B-2, Dbl. M.D., $800
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**TENONERS**—Fay & Egan No. 2 coupled drive motor upper-lower copes & C. O. 3 HP
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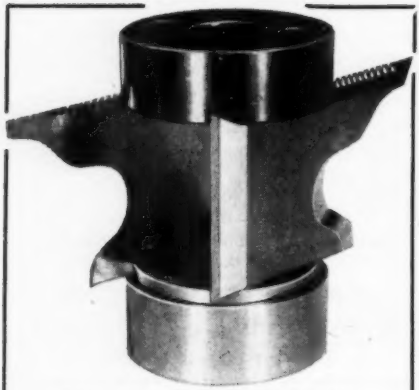

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**PLANERS**
Y-A Model B-8 30" Single, ball-brg., d.m.d.
Buss No. 44 30" Single, ball-brg., d.m.d.

**ROUTERS**
Porter No. 622 & Onsrud W-240 high speed elec.

**SANDERS**
Smith No. 401, 42" 3-drum endless bed, b.b.
Fay & Egan 48" 3-drum endless bed, b.b.
Wysong & Miles No. 275 hand block belt sander
Wysong & Miles No. 291, 6-ft. panel sander
Wysong & Miles No. 294 automatic stroke sander
Mattison No. 124 automatic stroke sanders
Wysong & Miles No. 289 oscillating edge belt
Wysong & Miles No. 309, 30" comb. Disc & Sp.
Root M207, 48" single disc sander, m.d.
Wysong & Miles No. 310, 36" double disc sander
Heath 24" & 38" 2-drum roll feed sanders

**SAWS—CUT-OFF—SAW TABLES**
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Bell No. 12-B double miter & cut-off saw
Y-A No. 8 tilt-arbor, roller table, m.d.

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Mattison No. 207 chain feed rip, d.m.d.
Hermance No. 300-G self-feed, d.m.d.

**SHAPERS**
Porter No. 200 SVM & Whitney No. 89 single sp.
Whitney No. 134, and No. 150 double spindle, m.d.
Jones-Superior No. 105 double end serpentine

**MISCELLANEOUS**
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Hawker No. 1 dowel rod machine, m.d.
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No. 356 Greenlee Vert. Sgl., Spindle DMD

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30" American Power Feed D.M.D.

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2—Tidey Saws—Motor Driven
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Buss 30" Direct Motor Driven Ball Bearing Single Planer
Buss 36" Direct Motor Driven Ball Bearing Single Planer
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Yates American 30" No. 177 Direct Motor Driven Ball Bearing Single Planer

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Yates-American 36" No. 177 DMD Ball Bearing Double Planer

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Wysong & Miles No. 171, MD., BB., Belt Sander
Wysong & Miles No. 277 Semi-auto. Belt Sander
Curtis Semi-auto. Belt Sander
Mattison No. 124 Automatic Stroke Sander
Mattison No. 137 Motor Driven Ball Bearing Belt Sander.
Pearson Waterfall Sander
Oakley Model E Double Sander
Yates-American 43" No. 431 direct motor driven endless bed sander.

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Fay & Egan No. 501-A Direct Motor Driven Ball Bearing Swing Saw
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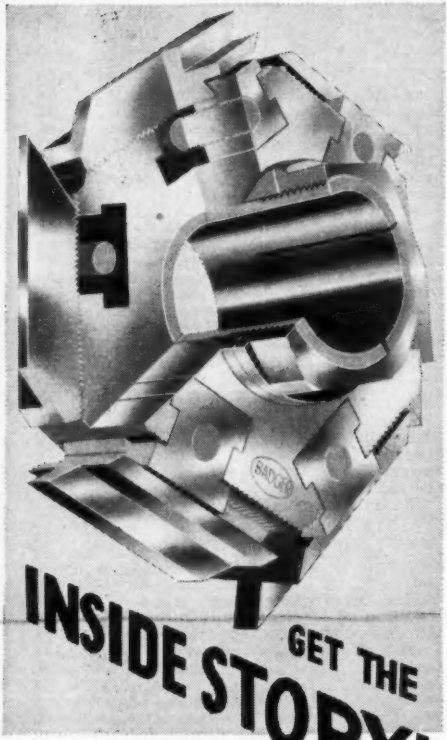

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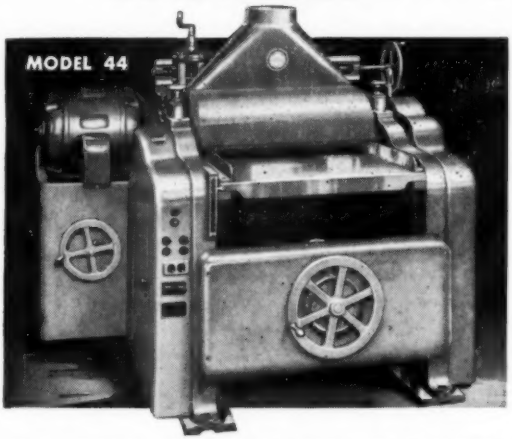


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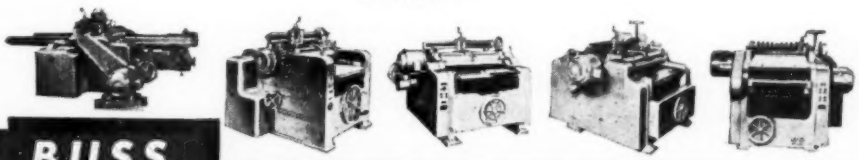
*MODEL 66 CAPACITIES: 30"x8, 32"x8, 36"x8, 38"x8, 40"x8, 42"x8, 50"x8, 52"x8



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